RECORD, CASE NOS. 14579 AND 14588.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1893.
TERM NO., ~~458~~. 128

THE UNITED STATES, APPELLANT,

vs.

THE BERDAN FIREARMS MANUFACTURING COMPANY

FILED APRIL 17, 1894.

TERM NO., ~~445~~. 135

THE BERDAN FIREARMS MANUFACTURING COMPANY APPELLANT,

vs.

THE UNITED STATES.

FILED APRIL 21, 1894.

APPEALS FROM THE COURT OF CLAIMS.

RECORD, CASE NOS. 14579 AND 14588.

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OCTOBER TERM, 1893.

TERM NO., 438.

THE UNITED STATES, APPELLANT,

vs.

THE BERDAN FIREARMS MANUFACTURING COMPANY.

TERM NO., 445.

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INDEX.

	Original.	Print.
Caption	1	1
Petition	1	1
Motion to amend petition	12	7
Traverse	13	7
Amended petition	14	7
Argument and submission	17	9
Opinion filed May 19, 1890	18	9
Order remanding cause	41	28
Reargument and resubmission	43	29

	Original.	Print.
Findings of fact	44	29
Conclusions of law	58	45
Motion to strike out certain testimony	59	47
Order overruling motion	60	47
Request of defendant to amend findings	61	48
Order on request of defendant to amend	64	49
Motion of defendant to amend record on appeal	65	49
Order granting motion	66	50
Order amending findings	67	50
Opinion filed December 8, 1890	68	50
Judgment	77	59
Application of defendant for and allowance of appeal	78	59
Application of claimant for and allowance of appeal	79	59
Clerk's certificate	80	60

1 IN THE COURT OF CLAIMS.

THE BERDAN FIREARMS MANUFACTURING Company *against* THE UNITED STATES. } No. 15726.

I.—*Petition filed July 26, 1887.*

The petitioner, the Berdan Fire-arms Manufacturing Company of New York, respectfully represents:

I. That heretofore, and prior to the 9th day of January, 1866, Hiram Berdan, a citizen of the United States, was the true, original inventor or discoverer of certain new and useful inventions, to wit, new and useful improvements in breech-loading guns; and that the said inventions were not known or used by others before his invention or discovery thereof, and was not, at the time of the application for letters patent therefor, hereinafter mentioned, in public use or on sale with the consent or allowance of the said Berdan, as the inventor and discoverer thereof, or of the petitioner, contrary to the provisions of the statutes of the United States, in such case made and provided.

That prior to the grant of the said letters patent, hereinafter mentioned, having assigned said invention to the Berdan Firearms Manufacturing Company by instrument in writing duly executed and recorded in the Patent Office, the said Berdan made application in writing to the Commissioner of Patents of the United States for the grant of letters patents for said inventions, and paid into the Treasury of the United States
2 the fees required by law, and then and there also duly complied in all other respects with all the necessary conditions and requirements of the statute of the United States, in such case made and provided.

That on the said 9th day of January, 1866, letters patent of the United States, bearing date on that day, were issued to the said the Berdan Firearms Manufacturing Company pursuant to the request of the said Berdan, and according to law; whereby there was granted to the said company, its successors, and assigns, for the term of seventeen years from said date the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the invention or discovery aforesaid, a description whereof was given in the words of the said Berdan in the schedule annexed to the said letters patent, and was made part of the same; that the said letters patent were issued in the name of the United States of America, and were signed by the Secretary of the Interior, and were countersigned and sealed with the seal of the Patent Office by the Commissioner of Patents, and were numbered 51,991, and were issued and delivered to the said the Berdan Firearms Manufacturing Company.

And your petitioner further shows that thereafter, and prior to the 15th day of September, 1868, the said company having surrendered the said letters patent, and having made due application for reissued letters patent, for the said invention, with the consent and approbation of the said Berdan, reissued letters patent, bearing date on the said 15th day of September, 1868, were duly made out, recorded, issued, and delivered to the said Berdan Firearms Manufacturing Company, for a part of said

invention described in said re-issued letters patent, as improvements in
breechloaders, and were numbered 3,117; whereby there was
3 granted and secured to the said company, its successors, and assigns,
for the remainder of said term of seventeen years, from and after the said 9th day of January, 1866, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said invention, described in said reissued letters patent.

And your petitioner further showeth that heretofore, and prior to the 27th day of February, 1866, the said Berdan being then, as he is now, and ever since has been, a citizen of the United States, was the true, original, and first inventor or discoverer of a certain new and useful invention, to wit, a new and useful "Improvement in Breechloading Firearms;" and that the said invention was not known or used by others before his invention or discovery thereof, and was not, at the time of the application for letters patent therefor, hereinafter mentioned, in public use, or on sale with the consent and allowance of your petitioner, or the said Berdan, contrary to the provisions of the statutes of the United States, in such case made and provided.

That the said Berdan, prior to the grant of the said letters patent, hereinafter mentioned, having assigned said invention to the Berdan Firearms Manufacturing Company, by instrument of writing, duly executed and recorded in the Patent Office, made application to the Commissioner of Patents of the United States for the grant of said letters patent for said invention, and paid into the Treasury of the United States the fee required by law; and then and there also duly complied in all other respects with all the necessary conditions and requirements of the statute of the United States, in such case made and provided; that on the said 27th day of February, 1866, letters patent of the United States, bearing date
on that day, were issued to the said the Berdan Firearms Manu-
4 facturing Company, pursuant to the request of the said Berdan,
and according to law; whereby there was granted to the said company, its successors, and assigns, for the term of seventeen years from said date, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the invention or discovery aforesaid, a description whereof was given in the words of the said Berdan in the schedule annexed to the said letters patent, and was made part of the same; that the said letters patent were issued in the name of the United States of America, and were signed by the Secretary of the Interior, and were countersigned and sealed with the seal of the Patent Office by the Commissioner of Patents, and were numbered 52,925, and were issued and delivered to the said the Berdan Firearms Manufacturing Company.

And your petitioner further showeth that heretofore, and prior to the 30th day of March, 1869, the said Berdan was the true, original, and first inventor or discoverer of a certain other new and useful invention, to wit, a new and useful "Improvement in Breech-loading Firearms;" and that the said invention was not known or used by others before his invention or discovery thereof, and was not, at the time of the application for letters patent therefor, hereinafter mentioned, in public use or on sale with the consent and allowance of your petitioner, or the said Berdan, as the inventor or discoverer thereof, contrary to the provisions of the statute of the United States, in such case made and provided.

That the said Berdan, prior to the grant of the said letters patent, hereinafter mentioned, having assigned said invention to the Berdan Firearms Manufacturing Company, by instrument in writing, duly executed and recorded in the Patent Office, made application to the Commissioner of Patents of the United States for the grant of letters patent for said
5 invention, and paid into the Treasury of the United States the fee required by law, and then and there also duly complied in all other respects with all the necessary conditions and requirements of the statutes of the United States, in such case made and provided.

That on the said 30th day of March, 1869, letters patent of the United States, bearing date on that day, were issued to the said the Berdan Firearms Manufacturing Company, pursuant to the request of the said Berdan, and according to law; whereby there was granted to the said company, its successors, and assigns, for the term of seventeen years from said date, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the invention or discovery aforesaid, a description whereof was given in the words of the said Berdan in the schedule annexed to the said letters patent, and was made part of the same; that the said letters patent were issued in the name of the United States of America, and were signed by the Secretary of the Interior, and were countersigned and sealed with the seal of the Patent Office by the Commissioner of Patents, and were numbered 88436, and were issued and delivered to the said the Berdan Firearms Manufacturing Company.

[Roberts' patent, Exhibit No. 5.]

In addition to the patents above set out, your petitioner, through the said Hiram Berdan, became the owner by assignment of certain inventions and improvements in breech-loading guns made by Bejamin S. Roberts, and which, by a written assignment bearing date the 19th day of February, 1866, had been assigned by the said Roberts to the said Hiram Berdan. A copy of this assignment is herewith filed as Exhibit No. 1. This is one of the improvements embraced in the proposal of the Berdan Firearms Manufacturing Company to the United States, hereinafter more particularly set out, and which was subsequently used
6 by the United States in the alterations of the muzzle-loader to a breech-loader, as well as in the new breech-loaders made at Springfield armory.

II. And your petitioner further shows, that on or about the 10th day of March, 1866, your petitioner, the said Berdan Firearms Manufacturing Company, submitted the said several inventions to a board, of which Gen. W. S. Hancock was president, for examination and trial; and subsequently, on or about the 27th day of March, 1866, submitted a proposition in writing, at the request of the board, specifying the terms and conditions and consideration upon which it would agree to allow the United States to use the inventions and improvements covered by said several letters patent, proposing in substance to grant to the United States the right so to use the said inventions upon payment to said the Berdan Firearms Manufacturing Company of two dollars for each arm or weapon containing either of said inventions to the number of 50,000; of one dollar and seventy-five cents for each of such arms to the number of

100,000; of one dollar and fifty cents for each of such arms to the number of 200,000; and one dollar and twenty-five cents for any additional number of arms, provided that when the total of such payments should amount to the sum of one million of dollars the United States should have the right to continue the use of such inventions without further payment.

And your petitioner further shows the fact to be, that the said several inventions, after having been examined and inspected by a board of officers duly appointed for that purpose by the Secretary of War, as above set out; and after the submission of the proposition aforesaid, were, by the said board, approved and recommended for adoption.

III. And your petitioner further shows, and charges the fact to
7 be, that from the 27th day of March, 1866, to the 31st day of March, 1886, the United States of America have continuously used the said several inventions during the respective terms of the letters patent therefor, and have in each and every year of the said period and respective terms manufactured and used large numbers of weapons and arms containing the said inventions, or some of them. The exact number your petitioner is unable to name.

Your petitioner sets out more fully and in detail the particular features of the said inventions, embraced in the above-named letters patent, which were used in the manufacture and alterations of the said arms, as follows:

The fifth claim in Patent No. 52925 (February 27, 1886), for extractor and ejector, is:

"The combination of the spur j, hook k, spring l, and ways mm, when employed in a breech-loading firearm having a recoil shoulder, c, in line with and at right angles to the bore, to completely eject a cartridge or shell without elevating the muzzle, substantially as herein set forth."

The fourth claim of Reissue Patent No. 3117 (September 15, 1868), for elongated hole in joint of breech-piece, is as follows:

"The elongation of the hole provided in the swinging breech for the reception of the pin upon which it swings, whereby the breech has a direct support in the breech receiver at the time of firing, and yet is free to swing back loosely to open the barrel for reloading, substantially as herein set forth."

The ninth claim of Patent No. 88436 (March 30, 1869), for spring working, above and below the center of the ejector, is:

8 "A spring so applied, in combination with the ejector of a breech-loading firearm, that, by the act of opening the breech piece, it is caused to act alternately above and below the center of motion of the ejector, and thereby to restrain the action of the ejector during the first part of the motion of the breech piece, and afterwards to produce its sudden action substantially as described."

The second claim of Patent No. 52925 (February 27, 1866), for brace safety notch, etc., is:

"The combination of the brace D, jointed to the swinging breech piece, the hammer and the safety notch in the tumbler, substantially as described, whereby the hammer, while held back from the firing pin, is made to prevent the detached end of the brace from rising above a position in which it locks the breech piece."

The fourth claim of Patent 52925 (February 27, 1866), for elongated hole, in combination with the face of breech entering the barrel, is:

"The elongated hole or holes in the strap E or other part of the hinge connection of the swinging breech piece C, in combination with the circular projection b, provided on the face of the breech piece to enter the chamber of the barrel, substantially as herein specified, whereby the self-adjustment of the breech piece to the recoil bearing is provided for, and the liability to strain the hinge by any rear or upward tendency of the breech piece is counteracted."

Copies of the several letters patents above mentioned are herewith filed, marked, respectively, Exhibits Nos. 2, 3, and 4.

IV. Your petitioner further states that the board for the examination of breech-loading arms, of which General Hancock was president, furnished, upon application, forms upon which proposals for grants of use of inventions for breech-loading arms should be made. It prescribed
9 all the formalities to be observed in making said proposals. Upon the form thus prescribed, C. L. Perkins, as president of the Berdan Fire-arms Manufacturing Company, on the 27th of March, 1866, submitted the proposition above set out, which proposal was sealed and directed to the recorder of the board, as directed.

On the 4th of June, 1866, the board, after fifty-five days session of trial and test of the many guns submitted by inventors, in pursuance of its public advertisement, reported "that the board recommends the plan of alteration submitted by H. Berdan. This gives the stable breech pin; secures the piece against premature discharge, and involves only a slight change of our present pattern of arms."

The War Department, after the adjournment of said board, proceeded to make alterations of the Springfield arm, and made use of some, if not all of the Berdan claims, as above set out, applicable to such alterations. The proposition of the Berdan Firearms Manufacturing Company embraced not only the right on the part of the United States to use the inventions then made, but all other inventions that might be made by the said Hiram Berdan for improvements in breech-loading firearms.

Your petitioner further states, that under the peculiar terms and provisions of the form of proposal prescribed by the board, a copy of which is herewith filed as *Exhibit No. 6*, it became the duty of the United States, when it proceeded to make use of the Berdan invention in the manufacture and alteration of the gun, to notify your petitioner of the number of guns it proposed to manufacture, in order that the price therefor, which was based upon a sliding scale, might be fixed and ascertained; that the United States did not give such notice, and thus left the petitioner
10 without the means of ascertaining the price until the rights had become extinguished by the expiration of the patents.

Your petitioner claims that it is entitled to recover from the United States, by virtue of said contract, the prices named therein for the guns manufactured.

V. In addition your petitioner charges that the said United States, in further breach of the said contract, which was limited to the use by the Government of the arms manufactured, and not the right to sell the same, did, in violation of said contract, sell a number of said guns, and for a

price to your petitioner unknown. And that by reason thereof the right accrued to the petitioner to demand and receive from the said United States the amount for which said guns were sold, less the cost of manufacture, if a new gun, and if transformed the value of the old one, including the cost of transformation, plus the royalty, in each case, and that by reason of the premises the United States promised and agreed to pay the same.

That in any event the petitioner, the Berdan Firearms Manufacturing Company, having offered the said inventions to the Government, and the said Government, through its duly accredited and authorized officers, having accepted the same by its use thereof, the United States became liable to pay to the petitioner a fair and reasonable compensation therefor, which in view of the subsequently ascertained value of the invention and the price paid for those sold by the Government, much exceeds in amount the prices named in the aforementioned proposition.

VI. And your petitioner further shows, that on or about the 5th day of March, 1886, the said Berdan Firearms Manufacturing Company, by an assignment in writing, bearing date on that day, and duly executed, assigned, and transferred all claims, demands, and causes of
11 action that the company might have against the United States, by reason of the premises, to the said Hiram Berdan, the original inventor, and a stockholder in said company. This assignment was made in order that the said Hiram Berdan might have the right to present the said claim to Congress, and which steps were duly taken as contemplated. That the said claim has been withdrawn from any further consideration by Congress, and the aforesaid assignment to the said Berdan has been by him delivered up and surrendered, and he claims no right of any kind thereunder.

That no assignment or transfer of said claim, or of any part thereof, or interest therein, has been made, except as hereinbefore stated. That your petitioner is justly entitled to the sum claimed, of one million dollars, herein claimed from the United States, after allowing all just credits and offsets; that the said petitioner, and all persons composing said company, have at times borne true allegiance to the Government of the United States.

HIRAM BERDAN,
President Berdan Firearms Manufacturing Company.
LINDEN KENT,
Att'y.

DISTRICT OF COLUMBIA, *ss:*

Personally appeared before me the undersigned Hiram Berdan, president of the Berdan Firearms Manufacturing Company, of New York, who, upon oath, says that the matters and things, as set forth in the above petition, are just and true, as he verily believes.

H. BERDAN.

Subscribed and sworn to before me this 26th day of July, 1889.
[SEAL.] JOHN RANDOLPH,
Ass't Clerk Ct. of Claims.

12 II.—*Motion to amend petition. Filed and allowed Oct. 8, 1887.*

And now comes the claimant, by his attorney, Linden Kent, and moves the court for leave to amend the original petition filed in this cause by inserting the following at the foot of paragraph III, on page 8:

And your petitioner further shows, and charges that the United States, in addition to the said several inventions described in the said petition, have continuously used the inventions described and patented under Letters Patent No. 101418, April 5th, 1870, during the term of said letters patent, and have in each and every year of the said period manufactured and used large numbers of weapons and arms containing the said inventions. A copy of said Letters Patent No. 101418 is herewith filed as Exhibit No. 7.

And your petitioner claims that it is entitled to recover from the United States for the use of the invention described in said letters patent, and also the said other several inventions described in the original petition, or of any of them by the United States, up to the filing of the original petition as set out in said petition, by the use of the guns covered by either or all of the said above-described letters patent.

(Signed) LINDEN KENT.

Oct. 8th, 1889.

13 III.—*Traverse. Filed June 28, 1888.*

And now comes the Attorney-General, on behalf of the United States, and answering the petition of the claimant herein, denies each and every allegation therein contained; and asks judgment that the petition be dismissed.

And as to so much of the said petition as avers that the said claimant has at all times borne true faith and allegiance to the Government of the United States, and has not in any way voluntarily aided, abetted, or given encouragement to rebellion against the said Government, the Attorney-General, in pursuance of the statute in such case provided, denies the said allegations, and asks judgment accordingly.

ROBERT A. HOWARD,
Assistant Attorney-General.

14 IV.—*Amended petition. (Filed July 2, 1888.)*

The petitioner, the Berdan Firearms Manufacturing Company, with the leave of the court first had and obtained, files this amended petition.

1. That from the 27th day of March, 1866, to the 31st day of March, 1886, the United States have continuously used the said several inventions described in the original petition, and have in each and every year

of the said period, manufactured and used a large number of weapons and arms containing the said inventions or some of them, to wit the following:

Fiscal year ending June 30.	Number.	Model.
1867	23,080	Springfield rifles, model 1866.
1868	26,920	Springfield rifles, model 1866.
1868	424	Springfield cadet rifles, model 1866.
1869	1,703	Springfield rifles, model 1866.
1870	500	Springfield rifles, model 1866.
1870	45,419	Springfield rifles, model 1868.
1870	310	Springfield cadet rifles, model 1869.
1871	6,710	Springfield rifles, model 1868.
1871	1,021	Springfield rifles, trial.
1871	341	Springfield carbines, trial.
1871	1,532	Springfield cadet rifles, model 1869.
1872	10,020	Springfield rifles, model 1870.
1872	1,557	Springfield cadet rifles, model 1869.
1872	20	Springfield carbines.
1874	500	Springfield rifles, model 1870.
1874	18,003	Springfield rifles, model 1873.
1874	10,019	Springfield carbines, model 1873.
1875	16,243	Springfield rifles.
1875	500	Springfield cadet rifles.
1875	10,004	Springfield carbines.
1875	10	Officers' rifles.
1876	14,018	Springfield rifles.
1876	1,017	Springfield cadet rifles.
1876	21	Springfield cadet rifles, model 1869.
1876	88	Officers' rifles.
1877	2,898	Springfield rifles.
1877	1,499	Springfield cadet rifles.
1877	2,497	Springfield carbines.
1877	136	Officers' rifles.
1878	9,954	Springfield rifles.
1878	1,050	Springfield cadet rifles.
1878	2,000	Springfield carbines.
1878	1	Officers' rifle.
1879	20,005	Springfield rifles.
1879	1	Springfield rod bayonet rifles.
1879	101	Officers' rifles.
1880	14,502	Springfield rifles.
1880	500	Springfield cadet rifles.
1880	5,585	Springfield carbines.
1881	14,831	Springfield rifles.
1881	500	Springfield cadet rifles.
1881	183	Springfield long range rifles.
1881	1,014	Springfield rod bayonet rifles.
1881	10,000	Springfield carbines.
1881	2	Springfield shotguns.
1882	23,036	Springfield rifles.
1882	54	Springfield rifles for infantry and cavalry.
1882	276	Springfield shotguns.
1882	50	Officers' rifles.
1882	12	Marksman's rifles.
1883	32,000	Springfield rifles.
1883	1,021	Springfield cadet rifles.
1883	600	Springfield shotguns.
1884	34,380	Springfield rifles.
1884	3	Springfield carbines, 24" barrel.
1885	16,955	Springfield rifles.
1885	20,000	Springfield rifles, model 1884.
1885	2,500	Springfield cadet rifles.
1885	2	Springfield rifles, experimental.
1885	500	Springfield shotguns.
1885	100	Officers' rifles.
*1885a	27,608	Springfield rifles, model 1884.
1886a	7,003	Springfield rod bayonet rifles model 1884.

a July 1 to March 31, 1886.

15 Also the following number of muzzle-loading rifles transformed to breech-loaders, from March 27th, 1866, to March 31st, 1886, which contain some or all of the inventions described in the original petition:

Fiscal year ending June 30—	Number.	Value of each to the breech-loader.	Model.
1867	8,780	$8.137	Springfield rifles, model 1864. Cal. 58.
1868	16,275	8.137	Springfield rifles, model 1864. Cal. 58.
1869	1,000	8.137	Springfield rifles, model 1864. Cal. 58.

That there was manufactured by the United States, from March 31st, 1886, to April 5th, 1887, 34,620 Springfield rifles, model 1884, and 6,880 Springfield carbines, model 1884.

That the arms manufactured and altered as above were upon the plans and embodied the inventions of the claimant as set out in the original petition; that the right to use said inventions in the manufacture of arms was offered by claimant to defendant, and was accepted and used by

the said defendant, and that the claimant expected and was entitled to receive just and proper remuneration for the right to use said inventions in the manufacture of arms, and for their use in said arms so manufactured.

The defendant thereupon became indebted to the claimant on an implied promise, and did so promise to pay the claimant for the just value of the use of the claimant's said inventions, to wit, the sum of five (85) dollars for each gun so manufactured or transformed with the said inventions, amounting in the aggregate to two million three hundred and ninety-five thousand (82,395,000) dollars.

But the defendant has not paid said sum of two million three hundred and ninety-five thousand (82,395,000) dollars, nor any part thereof, though often thereto requested.

And this further amendment of original petition, inserting after the description of the ninth claim of Patent No. 88436, on printed page eight, of said petition, the following:

"The fifth claim of Patent No. 88436 (March 10, 1869), for the escape of gas, is:

16 "Providing a passage for the escape of gas between the said strap piece and the top of the barrel, substantially as and for the purpose herein specified."

H. BERDAN,
President.

District of Columbia, ss:

Personally appeared before me, the undersigned Anthony Hyde, a notary public, in and for the District of Columbia, Hiram Berdan, president of The Berdan Firearms Manufacturing Company, of New York, who, upon oath, says that the matter and things, as set forth in the above-amended petition, are just and true, as he verily believes.

Subscribed and sworn to on the 29th day of June, A. D. 1889, as witness our hand and notarial seal.

[NOTARIAL SEAL.] ANTHONY HYDE.

LINDEN KENT,
Attorney.

17 V.—*Argument and submission of case.*

This case was argued by Mr. Boutwell and Mr. Berdan for the claimant, and by Mr. Dewees for the defendants.

It was submitted February 19, 1890.

18 VI.—*Opinion of Court.* (*Filed May* 19, 1890.)

DAVIS, J., delivered the opinion of the court:

In January, 1866, a board of officers was ordered to assemble in Washington during the following March to examine breech-loading firearms and to make recommendation in relation thereto. General Hancock was the president of this board, hence it has since been known as the "Hancock board." One of the questions submitted for examination and recommendation was this: "What form of breech-loading arm should be adopted as a model for changes of muskets, already constructed, to breech-loading muskets." The object of this direction is apparent; the war, then

practically finished, had shown the advantage of the breech-loader and it had left in the arsenals of the Government a great number of muzzle-loading arms of considerable value; these it was important should, if possible, be saved to the Government, and this could be done only after the invention of a practical method of converting a muzzle-loader into a breech-loader. Acting under their orders, the "Hancock board" invited inventors to submit arms to the board; each inventor was to state in writing the lowest price at which his arm would be furnished in the event of its being adopted by the Government. The Berdan Firearms Company, assignees of Hiram Berdan, the inventor, responded to this call, submitting several guns, one only of which is in issue now. This gun was recommended by the board, and this recommendation was approved by the Chief of Ordnance, by the Lieutenant-General, and by the Secretary of War. Nevertheless no gun was ever bought by the Government from the Berdan Firearms Company, and no gun was ever manufactured by the Government which was a copy of the gun recommended by the "Hancock board." The contrary is not alleged, but it is contended that the Government adopted devices invented and patented by Hiram Berdan (plaintiff's assignor), devices which appeared in the arm submitted to the board, devices which were, in effect, recommended by the board for adoption. It is also contended that later inventions of Berdan, patented by him and assigned to plaintiffs, were used by defendants.

Four patents are relied upon by plaintiffs. These we shall first examine, and if we find that the patents are valid and that defendants have used the protected devices, we shall then decide as to the alleged obligation of defendants to pay for such use upon the theory of a contract express or implied between them and plaintiffs.

19

All inventions relating to improvements in small arms and fixed ammunition turn upon points often difficult to be made clear without model or drawing and always difficult of comprehension to one not skilled in the art. The construction of the modern small arm and its ammunition depends for superlative success upon improvements in the various details of which they are composed, and many of those details are almost minute in size. We have heretofore heard argument upon a change in cartridge construction which could barely be seen by the naked eye; we have in this case listened to a discussion about a space which could be filled by the thickness of a sheet of writing paper; and it has been debated whether the paper did or did not fill the space.

The value or novelty of an invention does not at all depend upon the size of the object invented, but the minute changes, which in firearms are alleged to be important, are most difficult of clear elucidation and explanation.

The state of the gunnery art in 1866, when Berdan took out his first patent, is so well known that we need only refer to it generally.

The first and the last form of firearm is the breechloader. When and where the breech-loading cannon first appeared is difficult to determine, but its existence antedates the discovery of this continent, and it was in use long before the musket. With loose ammunition and crude breech devices, the breech-loading model was dangerous, uncertain, and short lived. An inexact breech mechanism permitted the escape of gas, flame, and smoke, thus corroding and injuring the gun, and placing the gunner in

danger; thence came the resort to the famous muzzle-loader, an arm now looked upon as antiquated through the revival of its progenitor. The great advantage of loading at the breech has always been recognized, but it was for very many years not found practicable to surmount the difficulties and dangers presented by this design. The turning point in the art was found in the metallic cartridge; this cartridge made possible a complete gas check without a tight-jointed breech mechanism

The complete result of a single-fire breech-loading military arm, such as is shown in the army gun of to-day, was not attained in a single stride; that result was reached by multitudinous efforts continued during very many years. No one of these efforts made a marked advance in the art; no one of them covered a new principle; but all have lead by successive and slight gradations to a successful single-fire musket, a musket which it is probable will be soon replaced through a like process by a magazine gun of a type yet to be entirely and finally developed.

Pauly in 1816 endeavored, through a "culot, plug, or cartridge stopper," to produce "an air-tight or perfect closure between the movable breech and the body or remainder of the gun;" yet, although often experimented upon, the successful metallic cartridge was not made for nearly fifty years.

The metallic cartridge was looked upon, and rightly, as the solution of the problem of safe loose-jointed breech mechanism; it was early recognized that a cartridge acting as a gas check was necessary to the production of this loose mechanism; a mechanism which should not rust and corrode under smoke, or expand and bind under heat; which should take a firm bearing during recoil, and which should be safe from the explosion of gas escaping backward from the barrel into the breech receiver and under the breechblock. Yet the war of 1861–1865 was fought with muzzle-loaders and a paper cartridge.

Morse had made, during the few years prior to 1861, some substantial advance toward official recognition of his gun as a military weapon; Spencer's carbine was used during the latter part of the war to a limited extent, and Berdan, an early and ardent advocate of the breechloader, was successful in having his men furnished with that class of arm.

From this it will be seen that we must approach this case with the recollection that there is not in breech-loading arms a new general principle; on the contrary, the art is one peculiarly marked by extremely slow advance; the cartridge suggested in 1816 was not perfected for forty-odd years, and a loose breech mechanism was not successfully introduced until later. We are told that there are in the Patent Office some two thousand patents upon firearms, and of these over thirty are produced in this case for our examination.

The condition of the art from 1866 to 1870 must be borne in mind very carefully in this case; that period is the one covered by the patents in issue, and it is the period of greatest activity of invention in this direction. During these years inventors first began to foresee a solution of the problem which should produce a safe, simple, effective breech-loading military arm, and during this period the Government took its most serious action towards the production and adoption of such an arm. Many minds were during these years working independently, working in different channels, working by different methods, all aiming to achieve the same result.

None of the inventions which we have examined in relation to this case involve a generic idea or principle. They all relate to details of construction, and embody the combination in different forms of old and familiar elements. So, in the plaintiffs' patents, it is apparent that the claims are narrow; they cover no general principle; they involve no novel elements; but are only and only pretend to be, new combinations of old elements destined to accomplish, in a novel manner, a desired and useful result.

That is, they are narrow claims, and are to be strictly construed.

21 The Berdan gun submitted to the "Hancock" board, and to which this branch of the action relates, embodied a design for a converted muzzle-loader. A full description of this and the other devices, either those of Berdan, or those alleged to have anticipated him in the inventions plaintiffs claim to be novel, appears in the findings of fact. The descriptions there are accurate, and form the official record upon which the case turns. In the opinion we shall be more colloquial in expression.

The gun which Berdan laid before the "Hancock" board was, plaintiffs contend, covered by letters patent (No. 52925), dated February 27, 1866; it was strongly recommended by the Board, and for convenience we call it the gun of 1866. Other guns were presented by plaintiffs at the same time, but they are not now in question.

The Berdan gun of 1866 embodied a design to convert a muzzle-loader into a breechloader upon the swinging breech system. Cutting open the barrel from the top, just forward of the stock, Berdan inserted into the chamber thus disclosed his swinging breechblock. This was made in two parts, jointed somewhat forward of the middle; the forward end, called the breech piece, was fastened to the top of the barrel by a hinge; this hinge was part of a flat plate which extended along the top of the barrel and was fastened into the barrel by screws, and the holes in the plate into which these screws were inserted were somewhat elongated, so as to allow very slight play in the plate. The rear part of this jointed breech piece is called the "brace," and in speaking hereafter of the parts of this gun we shall call the forward end of the compound structure the "breech piece," and the rear end the "brace." The brace (the after end or tail piece of the breech structure) is hinged on top to the breech piece proper; this hinge has its center in the plane of the axis of the bore when the breech is closed; the brace drops after loading into the back part of the breech-receiver and (with the breechblock) entirely fills up the space in the breech-receiver between the barrel and the recoil shoulder.

The rear end of the breech-receiver is beveled; that is, it is not perpendicular to the axis of the bore, but inclines backward from the bottom up, and accommodates at each side the "ways" for ejecting the cartridge. The brace is beveled at each side upon the same angle as the rear of the breech-receiver, while in the center of the rear of the breech-receiver—that is, at the head of the breech pin and between the cartridge-ejecting "ways"—is a recess, and a corresponding shoulder upon the rear of the brace fits into this recess. The rear wall of the recess and the wall of the shoulder which abuts upon it *it* are substantially at right angles to the axis of the bore, so that when the gun is held horizontally these walls are perpendicular. Here then appears what is called the "square" recoil shoulder.

So far we have described those portions of the mechanism which
22 relate more directly to the recoil, but, in addition and to prevent a tendency in the breechblock to rise during explosion, Berdan had upon the forward end of the breechblock a circular projection, or a "boss," so arranged that when the breech-piece was closed the "boss" should enter somewhat into the barrel and so lock the breech piece down, preventing a rising of its fo'ward end. The system of ejecting the cartridge found in this gun we shall consider later, and for the moment lay it aside.

To understand this breech mechanism it is best to glance at the reasons for its use.

It is apparent that a "square recoil shoulder," as it is called—that is, a recoil shoulder at right angles to the axis of the bore—is an advantage in breech-loading firearms, as it takes up the recoil in the line of the axis of the bore and transmits it nearly horizontally through the stock; whereas if the recoil be taken upon a beveled recoil shoulder there is a natural tendency to throw up the rear of the breech piece out of the breech receiver and so to cause accident.

A practical difficulty is encountered in attaining a square recoil shoulder in a converted muzzle-loader; for, if a piece be cut out of the top of the barrel of the old musket, leaving a "square" shoulder (one at right angles to the axis of the bore), and a solid breech piece be provided hinged at the forward end to the barrel, with a "square" shoulder, it will be seen that the breech piece can not be opened, if the hinge be attached while the breech piece is in the receiving chamber, or shut, if the hinge be attached when the breech piece is out of the chamber and swung up and forward; as then both surfaces, that of the recoil shoulder and that of the breech piece, being at right angles to the axis of the bore, there remains no space for the circular movement described by the lower angle of the rear end of the breechblock, when it is, at the same time and with one movement, swung up and forward upon the hinge attached to its top at the forward end.

A "square" recoil shoulder with a breechblock swinging up and forwards was considered advantageous. The combination of these two elements in one device was first obtained by Berdan in his jointed swinging breechblock, which gave him a "square" recoil shoulder and (by use of the joint) the upward and forward swing.

The claims made by Berdan in his application for letters patent (No. 52925) were as follows:

"1. A jointed swinging breech piece, when the detached end of the brace is forced or held in position by the hammer, or other suitable projection from the hammer shaft, substantially as herein set forth, for the purpose of communicating less strain to the hammer than when an unjointed swinging breechblock is used.

23 "2. The combination of the brace D, jointed to the swinging breech piece, the hammer and the safety notch *h* in the tumbler, substantially as described, whereby the hammer while held back from the firing pin is made to prevent the detached end of the brace from rising above a position in which it locks the breech piece."

Then follows a claim for a firing pin (not in issue), and the fourth claim was as follows:

"4. The elongated hole or holes in the strap E or other part of the hinge connection of the swinging breech piece C, in combination with the circular projection *b*, provided on the face of the breech piece to enter the chamber of the barrel, substantially as herein specified, whereby the self-adjustment of the breech piece to the recoil bearing is provided for, and the liability to strain the hinge by any rear or upward tendency of the breech is counteracted."

The fifth claim related to the ejector, which we shall consider hereafter.

There is a point made by defendants as to the identity of the gun shown in 1866 to the "Hancock" board with that described in the patent, and we find this difference between them: In the patent the breechblock is shown as fastened to the barrel by a plate screwed to the top of the barrel; in the Hancock gun the plate is abandoned and the breechblock is fastened by a band around the barrel; as this fastening is more secure than the plate screwed into the barrel, Berdan found it unnecessary in the Hancock gun to retain the locking device upon the forward end of the breechblock by which a "boss" entered the rear of the barrel and held the forward end of the block down during recoil. He also added under the firing pin a lip which falls under the hammer when the breech is closed and the hammer is down; this does not appear in the patent. A change in the ejecting mechanism also was made.

There was before the "Hancock" board a gun invented by an employé in the Springfield Armory, patented by him in 1865, and known as the Allin gun. It may be thus described:

The rear of the top of a muzzle-loader's barrel is cut away and into it is inserted a solid breechblock, hinged at the forward end to a plate fastened to the top of the barrel. The rear end of the recoil chamber is beveled; that is, it rises from the bottom of the chamber upon an angle tending backward, and the rear of the breech piece is similarly beveled. The breech piece is fastened down at the rear by a cam latch, which locks into a recess in the head of the breech pin, and this latch is operated by a shaft leading horizontally to the right side of the barrel under the hammer, where there is fastened to its end a lever or thumb latch, which prevents the hammer from striking the firing pin until the cam is in place and has locked down the rear end of the breechblock, and which is a handle to unlock the cam latch when the breechblock is to be opened.

So far, then, we find described a solid breechblock beveled at the rear end, working in recoil against the beveled shoulder, with the tend-
24 ency to throw upward met and counteracted by a cam latch which has no other duty than to prevent the rear end of the breechblock from blowing upwards during explosion. This cam latch takes no share in the recoil, which is entirely borne by the beveled recoil shoulder. There also appears in this gun a device intended to prevent premature firing through the position of the thumb latch or handle upon the end of the cam-latch shaft.

The forward end of the Allin breechblock is thus locked down: The rear end of the barrel is beveled at the top, and the bevel slants upwards and backwards; the top of the breechblock at its forward end is also

beveled, so that when the block is down and closed, its forward end at the top locks into and under the top of the barrel, forming a joint intended to prevent the block from lifting out at the forward end.

In his specifications Allin stated that his gun had six distinct advantages; of these the second alone is now important:

"Second. It is impossible to blow the piece A [the breechblock or recoil block] open, it being fastened at each end as described [at the rear by the cam latch, forward by the joint under the barrel]. It will lessen the danger in this connection, that it does not depend at all upon the pin *d* [the hinge pin at forward end of the recoil block], as this may be taken out without rendering the gun useless or dangerous, as a solid block C [the lower portion of the recoil block which rests upon bottom of breech chamber and most directly transmits the recoil] is interposed between the breech pin and the end of the cartridge in a direct line."

The words in brackets are inserted by us to explain the letters in the absence of the drawing.

In view of the line of argument taken at the trial certain points may here be noted upon this branch of the case.

Allin's breechblock was solid; it took up the recoil upon a beveled shoulder; it depended for safety against upward thrust at that point upon a cam latch which performed no duty in taking up the recoil; it depended upon the joint at the forward end to prevent possible upward thrust at that point.

Berdan, on the other hand, using a jointed breechblock, was able to obtain a square recoil shoulder between the beveled ejector "ways," and so to take the thrust upon the head of the breech pin substantially in the line of the axis of the bore.

Allin provided against any upward tendency in the forward end of the breech block by the beveled joint already described, while Berdan accomplished the same object in his patent by means of the circular boss at the forward end of the breech piece which entered into the barrel—a device abandoned in the gun submitted to the "Hancock" board.

It is claimed by plaintiffs, and it is true, that the Allin device was tight-jointed—that is, there was no room for play of the parts. Experience has shown a loose-jointed mechanism in breechloaders to be more advantageous than a tight-jointed mechanism. The improvement in fixed ammunition has developed the metallic cartridge into an efficient gas check so that it is no longer vitally necessary to provide in the breech mechanism against explosion under the breechblock. It is now possible to introduce a loose-jointed mechanism which is simpler in construction, less likely to get out of order, easier to clean and repair, less likely to bind through expansion, and which has fewer delicate adjustments than the tight-jointed mechanism required when the breech piece acted as a gas check.

The Berdan device, presented to the board of 1866, was a better gun than the Allin gun, and we have no reason to doubt, from what has been shown to us, that the board were right in their commendation of the invention. But that is not the question in issue; we must keep steadily in mind the one point under consideration; this point does not relate to the value of Berdan's inventions, but to the problem made up of these two elements: What did he patent—not what did he invent—and have the devices patented by him been incorporated into the Springfield gun?

Turning now to the Springfield gun, we lay aside, for simplicity of statement, intermediate models and take up the gun of 1884, which is for all the substantial purposes of this action the one deemed to embody the breech devices now sued upon.

It is claimed that in this design the cam latch performs the office of the brace in the Berdan gun; that the one is the mechanical equivalent of the other. As the use of the words "cam latch" and "brace" may lead to some confusion, we shall endeavor to describe the Springfield gun somewhat colloquially, and omit for the moment allusion to the point made by plaintiffs that what in the Springfield gun is called the "cam latch" is not such, but is in fact a "brace." In an endeavor to attain clearness of description we shall now call it a "cam latch."

In the Springfield gun the breechblock is solid and fills all the breech chamber except in this: It does not bear against the rear end of the chamber, and that end of the chamber is not intended to take up any part of the recoil, except upon the breech pin, as hereinafter shown.

The breechblock is fastened by a hinge at its forward end to the top of the barrel. The hinge pin is of less diameter than the hinge holes through which it passes, thus permitting some movement in the hinge to give play and so that the pin may not be cut during recoil.

There is a recess in the head of the breech pin; this is somewhat concave in form; into this the cam latch locks; the pin fastening the cam latch hinge is smaller than the hinge holes through which it passes, and this pin or shaft extends horizontally beyond the barrel, terminating in a handle or thumb latch, as shown in the Allin gun; when the breechblock is shut and locked this handle lies under the angle of the hammer,
26 but not in contact with it, and is so arranged that with the hammer in the third or lowest notch (or entirely down) the breechblock can not accidentally unlock and open. In locking or unlocking the cam latch this handle turns across the head of the firing pin, as in the Allin gun, and thus operates to prevent premature explosion.

In firing, the breechblock sets back under the force of recoil, the loose hinge at the forward end gives play there, the loose hinge of the cam latch gives play at that point, and the recoil is transmitted through the breechblock to the cam latch, with the head of which it comes in direct contact, and then through the cam latch to the head of the breech pin. By reason of the small diameters of the respective pins or shafts of the two hinges, as compared to the hinge holes through which they pass, no strain is brought upon these hinges by the recoil.

In Allin's gun the cam latch was simply a locking device, while in the Springfield gun it also takes up and transmits the recoil, as did the brace in Berdan's gun of 1866.

Examining plaintiff's claims (patent 52925), we find, as to the first one, a patent issued not for a jointed swinging breech piece, but for a jointed swinging breech piece "when the detached end of the brace is forced and held in position by the hammer or other suitable projection from the hammer shaft, substantially as herein set forth." The purpose of the invention is described to be a single one, viz, to communicate less strain to the hammer than when an unjointed swinging block was used. It would seem then, from this claim, that there existed breech locks whose rear ends were held down in the chamber during explosion by the hammer, or some other

suitable projection from the hammer, and this was the fact; that this system, it was deemed by Berdan, could be improved by substituting a jointed for a solid block, and that his patent was—not for a jointed swinging block—not for a device to hold down the rear end of a breechblock during firing, either by the hammer or by a projection from the hammer shaft—but through a combination of the two elements, neither one of which was claimed as new, to provide additional security against any upward tendency in the rear of the block during explosion.

Turning now to the patentee's specifications in explanation of his claim, it will be seen from the description therein that the invention relates "to a construction of and mode of applying, operating, and securing a swinging breech piece which is especially well adapted to the conversion into breechloaders of firearms originally constructed for muzzle-loading, but also applicable to breechloaders in general, and by which great efficiency and safety from accidental discharge are obtained." The object, then, of the invention is, in the specifications, shown to be what is so clearly stated in the claim: an endeavor to obtain safety through a device communicating less strain to the hammer than when an unjointed block was used.

27 After describing other parts of the invention, not at this moment important, the patentee said, as to his second claim, "a portion of the brace is so arranged with respect to the hammer that when the hammer is locked in a position out of contact with the rear firing pin by the entrance of the sear into a safety notch in the tumbler, it will, to such extent as the power of the main-spring is effective, prevent the brace from rising sufficiently high to unlock and permit the opening movement of the breech piece; and when the hammer is brought into the aforesaid locked position it will, if necessary, bring the brace to a position against the recoil bearing to secure the breech piece in a closed position."

Further on in the specifications, where the device is described in detail, we find this part of it intended to prevent the accidental opening of the breech piece. This, it should be remembered, was of particular importance in the Berdan device, where the breech apparatus depended entirely upon friction for its seat in the receiver, being without locking apparatus at the rear, other than is provided in this claim through the hammer.

Berdan's first claim (patent 52925) is not general. It does not cover a loose-jointed device, but a strictly defined combination. He there claims a jointed swinging breech piece when (and only when) the detached end of the brace is forced or held in position by the hammer or other suitable projection from the hammer shaft. In the Springfield gun the cam latch (claimed to be the mechanical equivalent of the Berdan brace) is not forced into or held in position by the hammer or other suitable projection from the hammer shaft. On the contrary, there is no connection between the cam latch and the hammer, and the handle attached to the cam-latch shaft lies (when the breech is closed) under the hammer, whereas the Berdan hammer falls upon the tail of the brace and holds it down with the full strength of its spring.

The Allin gun had no play in its parts; it was tightly jointed. The idea seems to have been to absolutely fill the breech chamber with the breechblock, so that when closed the block would bear tightly against the end of the barrel at the forward end, and tightly against the recoil shoulder at the rear end, and thus produce a practically solid barrel from the muzzle to

recoil shoulder, with no give or play at any part. It is apparent, as we have mentioned, that a breechblock of this kind, so tightly fitting, could not be what is termed "square" at the rear end; if it were it could not be opened if shut, or shut if opened, for there must be play for the circular movement described by the rear lower part of the breechblock while swinging at the same time upward and forward upon the forward hinge; hence the bevel of the rear of the breechblock became essential, as well as an equivalent bevel upon the recoil shoulder; this lead to danger of upward thrust of the rear of the breechblock during explosion, which Allin counteracted by the cam latch; this latch in his gun took up no
28 horizontal thrust during the firing, but simply and only locked the breech down so that it should not throw up during recoil; speaking broadly, during fire the Allin cam latch acted against perpendicular pressure, and the Berdan brace against horizontal pressure.

In the Springfield gun the cam-latch performs an additional office to that of Allin's cam-latch. The hinge-pin of the forward hinge and the cam-latch shaft are purposely made small and the hinge loose, that the pin and shaft may not be subject to injury during recoil and to permit play; the horizontal elongation of the hinge-pin hole permits the breechblock to slide bodily backwards under the influence of the discharge; the cam abuts against the surface of its recess in the breechblock at one end and transmits the recoil from the surface of this recess at one end to the face of the breech-screw at the other end without subjecting the shaft upon which it turns to any strain; by the elongation of the hinge-pin hole in the breechblock and the intentional looseness of the cam-shaft and arbor in the bearings the transmission is effected (through the interposition of the cam) of the force of recoil from the breechblock to the breech-screw.

The bearing of the cam is above the center of the breech-screw, and its resistance consequently, through the resolution of the force of recoil, tends to press the rear end of the breechblock downwards. The front end of the block is secured against lifting, in case of escape of gas from the cartridge, by the engagement of the flanges at its forward end under ears made upon the receiver substantially in the form used by Allin.

The Berdan gun (patent 52925) was not loose-jointed; when the breechblock was down there was no play, for then the block abutted against the barrel at one end and against the breech-screw at the other. Berdan by jointing his block procured a square recoil shoulder against the end of the breech-pin, but he did not procure any play in the parts; there were elongated holes in the plate fastening of his breechblock, as shown in the Patent Office model, a device replaced in the gun, shown the "Hancock" board by a band which has a minute slip upon the barrel under strong pressure; but neither the holes nor the band are even claimed to give looseness of construction; they only take up some slight wear of the parts.

The square recoil shoulder and the elongated holes appeared so often and persistently in argument that we are forced to allude to them as incidents in this proceeding; but they are not important to a decision, as we have seen from the recital of Berdan's specifications and claims in his application for patent.

The element of safety was the one aimed at by Berdan; his claims show that he was not endeavoring to patent a loose-jointed breechblock system,

whether obtained by elongated holes or a loose band; nor did he
29 intend to patent a square recoil shoulder in combination with a jointed swinging breech-piece swinging upward and forward, nor to patent such a breech-piece in combination with either a square recoil shoulder or with elongated holes in the hinge fastenings or either of them.

His first claim is for a jointed swinging breech-piece held down by the hammer or some other suitable projection from the hammer-shaft. If the present Springfield gun have a jointed mechanism, as claimed by plaintiffs, still the Government is not using the device covered by this claim, for in the Springfield gun neither the hammer-guard nor the firing-pin guard is intended to hold down the breech-block by catching under the hammer; on the contrary, the resultant force from explosion acting through the block and cam-latch tends backward and downward upon the head of the breech-pin, thus acting to hold the rear of the breech-block down in the chamber, and any office performed by the cam-latch in locking the breech-block is performed in the Springfield gun of to-day as it was performed in the Allin gun of 1865, unless in one particular, which we shall hereafter notice in connection with another claim.

The third claim (patent 52925) is for the firing-pin, not now in issue; and the fourth is for the elongated holes in the hinge connection of the swinging breech-piece in combination with the "boss," which, projecting from the front end of the breech-piece, enters the barrel when the breech-piece is down for a purpose thus stated: "whereby the self-adjustment of the breech-piece to the recoil-bearing is provided for, and the liability to strain the hinge by any rear or upward tendency of the breech is counteracted."

In this gun of Berdan's (patent 52925) the elongated holes do not allow of any play in the parts; they simply allow the taking up of slight wear produced by friction upon the recoil shoulder or the rear of the breech-block; this was admitted in argument and so requires no careful examination; but it may be noted that Berdan's object, as shown in the specifications, was not to protect the hinge-pin, for while he states that the elongated holes may be in the hinge, he does not look upon this position as important and he did not put them there in his drawing or model; nor was this important for the purpose now admitted as the one he had in view, which was merely to take up wear by friction and not to produce a loose-jointed gun.

The entering "boss" does not appear in any Springfield gun, but we do find a flange at the forward end and on top of the breechblock which engages under an ear upon the top of the barrel substantially after the Allin design.

The elements of the combination set forth in this fourth claim do not appear in the Springfield gun, and it may be again noticed that in the gun
30 presented by plaintiffs to the Hancock board in 1866 the plate and elongated holes were abandoned and were replaced by a band, and the entering "boss" was omitted as unnecessary because of the greater strength in fastening obtained by the band as compared to the plate screwed on to the barrel.

The second claim (patent 52925) combines (*a*) the brace, (*b*) the swinging breech-piece, (*c*) the hammer and safety notch in the tumbler, to ac-

complish a purpose thus described: "Whereby the hammer while held back from the firing-pin is made to prevent the detached end of the brace from rising above a position in which it locks the breech-piece."

In the Berdan gun (patent 52925) there was no method of locking down the brace or tail of the breech-piece. Except for the hammer it was held in line with the barrel simply by friction; when the Berdan hammer was upon the head of the firing-pin (which projects through the rear end of the brace) it operated to hold the brace down; then by use of the third notch the hammer could be held slightly relieved from contact with the firing-pin, and yet so close to it that the brace could not accidentally open, as in so doing it would strike the end of the hammer. This is the result covered by this claim.

In the Springfield gun the cam-latch shaft lies under the angle of the hammer; the arrangement in the Springfield gun is intended to prevent premature firing, but it is not intended that the hammer shall perform any office in holding down the rear end of the breechblock during explosion; in the Springfield gun the resultant force during recoil tends to hold the rear end of the block down. The arrangement of the cam-latch shaft as found in the Springfield gun makes it impossible for the breechblock to open accidentally when the hammer is in the third notch; you can not then lift the block without striking the hammer. The device found in the Springfield gun of to-day to prevent accidental unlocking and premature explosion is exactly the device found in the Allin gun except in this: The Allin gun did not have the third notch.

The Allin gun had just the characteristics now in issue, except the third notch. With this exception, in so far as this locking device is concerned, the Springfield gun of to-day operates as did the Allin gun of 1865. In the Allin gun the cam-latch shaft falls under the angle of the hammer and can not be lifted when the hammer is down; the handle of the cam-latch is so arranged as to prevent contact by the hammer with the firing-pin in opening or closing the breechblock, and the drawings of this part of the device as appearing either in the Allin gun or the present Springfield gun could not be distinguished. Allin's cam was not intended to take recoil, but to counteract upward thrust. That is, it was purely a locking device, and his specifications show that, after locking the cam into its re-
31 cess in the recoil shoulder, if, by any accident the lever at the end of the cam-latch shaft should not be turned down it is impossible to fire the gun, for the hammer in coming down will strike the lever and throw it up against the breechblock, thus preventing the hammer from striking the firing-pin, or if the lever be turned down part way, but not entirely, the hammer in coming down strikes over it and forces it with the breechblock down into place; and this is the device in the Springfield gun.

The second claim of plaintiffs' patent 52925, covering this subject, is a combination made up, as we have seen, of these elements:

First, the brace: We are of opinion that the change in construction of the cam latch in the Springfield gun, whereby it takes all the recoil, has made of it a brace without sacrificing its qualities as a cam latch.

Second, a swinging breech piece; this is found in the Springfield gun and the Allin gun.

Third, the hammer; and fourth, the safety notch, both found in the Springfield gun.

The result aimed at by the Berdan combination was thus stated: "Whereby the hammer, while held back from the firing pin, is made to prevent the detached end of the brace from rising above a position in which it locks the breech piece."

Admitting the cam latch to be a brace for the purposes of recoil, it nevertheless remains a cam latch for all locking purposes, and the operation of the Springfield device is, first, to prevent the arbor turning and thus unlocking the latch; second, to prevent an upward movement of the rear end of the breechblock. Berdan's device was intended to prevent danger from explosion of gas under the breechblock as well as to prevent premature firing. The Springfield device simply prevents the breechblock from opening accidentally should the gun be held muzzle down or turned over, barrel down. This was done in the same way by Allin, and we are of the opinion that with Allin's gun before him, or the Springfield gun before him, and knowing of the three-notched tumbler (which is old), any mechanic could have attained the result now found in the Government gun by simply adding a notch to the two-notch tumbler in the Allin gun. The change in the cam latch whereby it takes the recoil had involved no change in the position of its shaft and thumb piece, and the addition of the third notch to the existing device was an exercise of ordinary mechanical skill.

The Berdan gun of 1866 was a valuable gun, a much better arm than the Allin gun, and we have no doubt that it formed a substantial step in aid of the material improvement of breech-loading small arms. Berdan procured through his device what had not then been invented—a method of combining in a converted muzzle-loader a breechblock swinging upward and forward, with its recoil taken upon a shoulder substantially at right angles to the bore of the gun; he brought the resulting force of recoil substantially in line with the axis of the bore and avoided the use of the dangerous bevel upon the recoil shoulder and rear of breechblock. It may well be that thus Berdan gave to Army officers the idea which led to the broadening of the face of the cam latch, to the loosening of the hinges, and to the other changes in the Allin gun which resulted in the present loose-jointed mechanism by which the recoil passes to the breech pin through the cam latch without strain to any minor part. Whether this be so or not, whatever be the history of the evolution of the present army gun, plaintiffs' patent No. 52925 does not cover it.

The patentee did not aim in his application to protect a loose-jointed mechanism through elongated holes or otherwise; he did not claim the practical attainment of a square recoil shoulder in combination with such a mechanism; on the contrary, his claims were very narrow—first, a jointed swinging breech piece held in place by the hammer; this does not appear in the Springfield gun, for if the cam latch be so constructed as to make it and the breechblock together, mechanically the Berdan jointed swinging breech, still it lacks the quality of being held in place by the hammer, but has the very substantial advantage of holding itself in place by the resulting force of the recoil, aided in case of need by the perpendicular resistance of the cam latch. The fastening of the forward end of the Springfield breech piece is that shown in the Allin gun. The patentee also claimed the combination of the brace, the swinging breech piece, the hammer, and a safety notch, a mechanism intended to keep the brace from

opening accidentally; so far as a device admitting of this description occurs in the Springfield gun it is a reproduction of the device shown in Allin's patent of 1865, with a third notch added in the tumbler; the addition of this notch being merely a mechanical change.

Plaintiffs have shown no patented rights to the breechblock system of the Springfield gun, whatever may be the credit to which their assignor, Berdan, is entitled for the incentive given by him to inventions in breech-loading firearms.

In the patent of 1870 (No. 101418) plaintiffs rely upon the second claim, which is as follows:

"The extension of the rear end of the jointed brace of a swinging breech piece or of the rear portion of a jointed breech piece in a lateral direction, in such manner that the extension serves both as a guard to the firing pin and a handle to operate the breech piece."

The invention assumes the existence of the "swinging breech piece," or of the "jointed breech piece," and adds to it a lateral projection, serving to prevent premature discharge and to open and close the breech piece.

What we have already said as to the second claim under patent 52925
33 leads us to the conclusion that plaintiffs have no rights as against the Government under this claim of the later patent.

Turning now to the extracting and ejecting devices, we shall first examine the claims upon this subject covered by patent 52925.

The mechanism of the patented gun may be thus described:

In the middle of the hinge shaft of the breechblock and fastened to it is a slight projection or spur; this turns with the hinge, and to give it play through the barrel, as the hinge turns, a slot is cut in the rear end of the barrel top; when the breech is closed this spur is above the cartridge and clear of it; after firing the breech is turned upwards and forwards, while the spur attached to the hinge shaft turns with the shaft downwards and backwards, and thus engaging the flange of the cartridge carries it for a short distance back and out of the barrel. The object of the spur is to loosen and start the cartridge. In the patented gun there is also found in the bottom of the breech-receiver near its forward end a hook; this hook has a movement in line with the barrel; it runs in a slot and is controlled by a spiral spring set under the barrel in the stock; this spring, when at rest, holds the hook at the rear end of the slot.

This ejector device operates in thus: The breech being thrown open, the cartridge is placed in the receiver; it is then shoved forward into the barrel and the breech is closed; in the forward movement of the cartridge into the barrel its shoulder, rim, or flange catches the ejector hook, which is drawn forward against the resistance of its spring until the cartridge is in its place in the barrel and there secured by the shut breechblock; in closing the block the overhead spur recedes into position above the cartridge flange. After firing the breech piece is raised, the spur descends and moves backwards, so loosening the cartridge and moving it slightly back in aid of the hook, whose spring now free carries it quickly back, drawing the cartridge, which, impelled by the velocity acquired from the spring, shoots up the "ways" at the end of the breech-receiver and so out of the gun.

In the model before the Hancock board the following changes in the ejector device appeared: The extracting spur at the top was retained; the

hook was transferred from the bottom of the receiver to the left side, and was a projection from the upper end of a U-spring, the spiral spring being abandoned; a friction plunger was placed in the middle of the bottom of the receiver, held up against the cartridge head (when the gun was loaded) by a flat spring placed underneath the barrel.

The inventor claimed (under patent 52925) a combination made up of these elements: the spur, the hook, the spring (shown to be a spiral spring), and the "ways." This combination, he claimed, "when employed in a breech-loading firearm having a recoil shoulder, C, in line with and at right angles to the bore," for the purpose thus described—to com-
34 pletely eject a cartridge or shell without elevating the muzzle, substantially as set forth in his specifications.

The Allin gun of 1865 also contained an ejector device, which may be thus described:

The forward upper end of the breechblock on the right side projects over the barrel and engages under the hinge; the lower side of this projection is curved, and in it are cut several teeth; under this projection, outside of the receiver, but with its top slightly below the plane of the top of the breech-receiver, is a rack which is fitted on its top with similar teeth and which runs on a slide parallel to the axis of the bore and is held at the forward end of this slide by springs concealed in the stock forward of the breech-receiver; a hook attached to this rack enters the receiver and slides with the rack in the line of the barrel in a longitudinal slot cut in the receiver on the plane of the rack. When the breech is closed the rack is at the forward end of its track, the pin hook is at the forward end of the receiver, in fact, slightly within the barrel, and engages the forward side of the cartridge rim or shoulder; when, after firing, the breechblock is raised and swung forward, the teeth of the pinion engage those on the rack and carry it back towards the rear of the receiver; thus, through the interposition of the hook which has caught the cartridge rim, the cartridge is withdrawn from the barrel into the receiver. This was a device for extracting, not for ejecting, the cartridge.

Allin has also a device for releasing the rack when this work is done, and so permitting its spring to draw it forward again to its first and normal position. A plunger in the bottom of the receiving chamber was intended to, but did not in practice, eject the cartridge. The Allin device extracted the cartridge from the barrel, but did not successfully eject it from the receiver.

The Springfield gun of 1866 has a U spring, a hook, which is a slight projection from the upper end of the spring; this hook runs in a slot at the side of the barrel; there is a spur attached to the hinge at the top, a friction plunger, and in place of the "ways" a deflecting stud is placed in the bottom of the breech-receiver. This ejector device, except for the omission of the "ways" and the substitution of the deflecting stud, is the device found in the gun submitted by Berdan to the "Hancock" board.

Several patents have been introduced as anticipating this Berdan device, and to these we shall now give some consideration.

The Peabody gun first in date of patent (July 22, 1862) shows none of the elements of ejectors in issue now and does not require consideration in this connection.

Joslyn (patent dated August 4, 1863) described a cam-shaped projection with a bevelled edge secured to the forward end of the breech piece
35 and so suited in respect to the cartridge that on elevating the breech piece the beveled edge of the projection bore against the flange of the cartridge "and withdraws the same to a limited extent from the bore of the barrel." He also describes a spring "situated in an opening formed in the stock in the rear of the barrel," secured to a plate attached to the under side of the stock, the spring being of such length that it just bears at its upper end against the inside of the cartridge flange. He thus describes the operation of his device:

"During the elevation of the breech piece the beveled projection *b*, bearing against the flange of the case, withdraws the latter from the bore to a very limited extent. At the same time the edge of the projection *b* bears against the side of the case and returns the same, thereby preventing the spring from forcing the case from the bore until the latter is thoroughly exposed and the breech piece presents no impediment to the withdrawal of the spent cartridge. The force of the spring is thus reserved until the breech piece is thrown back and the projection *b* is free from contact with the cartridge case, when the spring, acting on the same, will suddenly force it from the bore and discharge it clear of the firearm."

In this patent we first find an ejector as distinguished from an extractor; but it will be noticed from the specifications and drawings that this ejector acts entirely in the plane of the axis of the bore. The barrel is elevated above the stock, so that with the breech piece raised no recoil shoulder remains and the ejector performs no lifting office. This device would be useless in the Springfield gun, and in that arm would operate merely to throw the cartridge back into the receiving chamber, but not up and out of the gun.

The Wright gun patented in 1864 has a spur in the hinge at the top, also a hook in the bottom, which is the projection of U spring. This device will extract the cartridge from the barrel, but will not eject it from the receiver. Wright did not claim that it would eject; on the contrary, he said that his device would push the cartridge so far back as to allow its ready removal by the fingers.

Roberts obtained a patent dated September 23, 1862, reissued September 5, 1865, in which he describes the spur, claiming that it partially draws the cartridge from its seat in the barrel, so that it "can be very readily and conveniently removed by hand, or by reason of its conic form will drop, "out and another may be inserted in its place."

February 27, 1866, other letters patent were issued to Roberts. In this device he shows the spur again and also "ways;" there is, however, no provision for ejecting the cartridge, nor was it claimed that the device would so operate. Upon this subject Roberts said in his specifications "as it (the breechblock) rises the hook or catch *i* engages with the rim of the shell of the cartridge and partly retracts it; * * * this
36 shell being made slightly tapering, it becomes loosened by this retraction, so as to fall out by its own gravity when the muzzle of the piece is sufficiently elevated." This gun of Roberts was so arranged that by elevating the muzzle the cartridge, loosened from the barrel, would slide out.

No other device has been brought to our attention as existing prior to the issue of patent 52925, which, in a breech-loading arm having a receiver with a rear wall, either straight or beveled, would throw the cartridge out of the gun.

The Berdan extractor (patent 52925) was intended for rim-fire cartridges and was not successful when used with center-fire cartridges, for this reason: The flange of the rim-fire cartridges expanded somewhat at the time of explosion and the shell thus took a firm seat in the barrel; this expansion did not occur in the center-fire cartridges, and therefore the shell was pressed back by the ejector spring in proportion to the speed with which the breechblock was raised; the movement thus communicated to the cartridge was therefore not sufficiently sudden to throw the cartridge out of the receiver. To counteract this difficulty Berdan introduced a friction plunger into the receiver just behind the cartridgehead, thus counteracting the backward pressure of the spring until the breechblock was open sufficiently to allow the shell to clear the face of the breechblock when ejected, so that its motion backward should be sudden and should not be impeded by the intervening breechblock. This friction plunger, singly or in combination, was not patented by Berdan.

It appears, then, that the ejector in patent 52925 would only operate when a rim-fire cartridge was used, and so was not adapted to the center-fire cartridge.

As the extracting device (patent 52925) would not operate with a center-fire cartridge without the addition of an element not found in the patented combination, to wit, a friction plunger, the importance of that element might well give rise to discussion under other circumstances. But no device at all like the one we have been considering appears in any Government gun made after 1868, nineteen years before this action began. So we may leave this branch of the case and proceed to the next and more important issue presented.

In the Springfield gun of 1868 appears for the first time the ejecting device now in use, and the hook, spur, and friction plunger disappear from the case.

In March, 1869, letters patent were issued to Hiram Berdan for an improvement in breech-loading firearms; this patent, numbered 88436, covered what has since been known as the "Russian-Berdan" gun,
37 and but one of its features is now in issue—that feature is thus described in claim 9 of the schedule referred to in the letters patent:

"A spring, so applied in combination with the ejector of a breech-loading firearm that, by the act of opening the breech-piece, it is caused to act alternately above and below the center of motion of the ejector and thereby to restrain the action of the ejector during the first part of the motion of the breech-piece, and afterwards to produce its sudden action, substantially as herein described."

The device, it will be seen, was intended to act with a sudden and violent motion—a snap—and for this reason it had been found in practice that the raising of the breech-block had gradually released the spring so that the cartridge began to move back as the breech-block went up, thus releasing the tension of the spring gradually instead of suddenly. The result was that by the time the cartridge head was finally free of the rising

breech-piece it had moved some little distance back, and so had slowly taken off much of the tension upon the ejector spring, leaving that spring at the first moment of absolutely free action without sufficient strength in reserve to throw the cartridge against the deflecting "ways" or stud with such force that it would rise out of the receiver and fall out of the gun. The problem was to find a spring which should be absouletly at rest until the breech-block was up and out of the way and the road for the cartridge to the deflecting stud was clear; a spring which at this opportune moment should suddenly, with a snap, throw its full force against the cartridge flange giving the shell such velocity that its momentum would throw it up and out of the receiving chamber upon striking the deflecting stud or "ways."

We have seen that the Berdan friction plunger (not patented) was an effort in the direction of the result desired, but that device was but a step towards a perfect result. The Berdan Russian gun does the work and does it well—of this we have had ocular demonstration. The Springfield gun since 1868 has had the same device with one exception, to wit, instead of a flat spring, as shown in the Berdan Russian gun, it has a spiral spring which is contended by plaintiffs to be the mechanical equivalent of the Berdan device. Inspection shows no difference in the operation of the Springfield device from that of plaintiffs; they are alike in construction except for the different kind of spring.

The defense allege that the device is not novel; first, in this: That the invention was made at the Springfield Armory by a Government machinist prior to the filing of Berdan's application for a patent. The time was very close between the two independent inventions of substantially the same device, but the findings show that Berdan had priority. He made application to the Patent Office July 21, 1868, while the Springfield extractor was not invented before the following September.

Some time in 1868 a device called the Lamson or Ball ejector was experimented with by the defendants. It was a flat straight spring
38 attached to the top of the barrel and resting upon the plate extractor, which was hung loosely upon the hinge-pin. In actual use this device was found defective because the points would dry between the ejector-plate and the part of the spring movemont upon it, and after a certain number of extractions it would become worthless, wearing a hole through the spring. This device would accelerate the cartridge efficiently, but soon become unserviceable and was discarded. This invention was covered by Letters Patent 60,664, dated January 1, 1867, issued to Albert Ball.

As this device proved ineffective several employés of the Springfield Armory set to work to invent a practical ejector for the Government gun, one which would work efficiently notwith-tanding grit, dirt, and weather; one of these employés, Benjamin F. Adams, did invent the device soon after adopted and since then and now in the Springfield gun. But Adams did not make his invention until after August, 1868, and Berdan's application for a patent for his device had then been some weeks on file. Adams worked independently of Berdan, and the case presents a not unusual coincidence of independent invention.

Several devices are alleged to have anticipated Berdan. Of these two seem to be of sufficient importance to warrant examination in this opinion, although all are set forth in the findings of fact.

First is the one already mentioned.

Albert Ball obtained a patent in 1867 for an "improvement in cartridge retractor for breach-loading fire-arms." Ball's retractor (sometimes called the "Lamson" ejector) was thus constructed: A flat straight spring was firmly attached at its forward end to the top of the barrel; at its rear end the spring rested upon the plate extractor, which was hung loosely upon the hinge-pin; the spring acting upon the ejector plate gave it an accelerated motion at the proper time, when the plate, engaged as its was upon the cartridge-flange, jerked the cartridge out of the barrel. This device operated as does a knife-blade, that is, to and from the center of motion, not above and below the center of motion, as in the Berdan invention. This device of Ball's was tried at the Springfield Armory and abandoned as a failure; the point of the spring was liable to stick against the ejector; the surface of the ejector became covered by a hard deposit from the smoke; against this the spring would not work; the points would get dry between the ejector plate and the part of the spring movement upon it, and after a certain limited number of extractions a hole was worn through the spring. The invention was a failure and was thrown aside.

The device next adopted was that invented by Berdan or Adams. This device has been since in use and is simple, effective, and certain in its operation. The Berdan (or Adams) device avoided the difficulty which rendered the Ball extractor a failure. It does not clog from smoke, nor wear away in use; the application of the spring power is different
39 from that of Ball, for he applied his power to and from the center of motion, while Berdan applied his above and below the center of motion, so that there was no friction except at the instant of passing the center of motion. Both Berdan and Ball aimed at the same result; Berdan attained it, Ball only approached it. The success was not in the kind of spring used, nor in the ejector-plate—the plate was old; so are all springs—but in the manner in which the spring operated upon the ejector-plate in the combination. It is a small change to the eye, but it is a change which converted failure into success.

Smoot's patent of August 27, 1867, is also much relied upon by defendants. This consisted of a U spring under the barrel in the stock, firmly fastened at its forward end so it could move only to and from the center of motion; to the rear end of the U was pivoted a connecting-rod, which, at its other end, was pivoted to the extractor plate, which was substantially circular in form and turned upon the shaft of the breech-piece; it had two slight projections or shoulders close together upon one side, and nearly opposite these a long projection or arm falling under the breech-piece when that was closed.

The only arrangement of the device shown us is adapted to a gun having a breech-piece moving downward and forward, and therein the device thus operates, starting with the breech-block closed. The first shoulder engages the cartridge head just forward of the flange, and the opposite and long projection or arm lies under the breech-piece. After firing, the breech is lowered, carrying with it the arm; this turns the plate and moves the opposite shoulder backward, carrying the cartridge. This movement of the extractor carries the connecting-rod of the spring upward into a position parallel to the barrel, against the force of the spring. Upon passing the position parallel to the barrel, the spring is no longer

restrained by the movement imparted to the plate by the arm acting under the descending breech-piece, and the spring snaps open, throwing the connecting-rod suddenly upward and backward, thus revolving the ejector plate quickly and bringing the second shoulder sharply against the cartridge flange, the first shoulder in the circular movement described by the plate having disappeared backward and downward. The spring we have seen moves to and from the center of motion parallel to the axis of the barrel, and the result of sharp expulsion is obtained through the intervention of a connecting-rod. The device is complicated; it is not shown that it has ever been used, or that it is useful; it can not be successfully employed upon a gun of the Springfield model. The Smoot device can not be held to be of such a nature that it would suggest to a mechanic, however skilled, the Berdan or Adams extractor.

We do not find that the patent of 1866 (No. 52925) covers, as is contended, the extracting device shown in the Berdan-Russian and
40 Springfield-Adams arms. It is urged that the retracting hook and the plate are equivalents; if this be true, still it does not aid plaintiffs, for the hook was patented by Roberts, and Miller described the plate. True, Berdan obtained an assignment from Roberts of the device covered by patent No. 36531 (reissued as numbers 2067 and 2068), but that assignment was limited to the right to make, use, and vend the retraction hook and to authorize others to do the same, but only "in connection with any arm invented or patented by said Berdan, or that may hereafter be invented or patented by him." The Springfield gun, whether or not it contains some of Berdan's devices, can not be held to be a gun invented or patented by Berdan in the sense of this assignment.

Finally, all of Berdan's patents cover combinations; none cover any of the elements of those combinations, and the Russian-Berdan ejector does not present the combination shown in the Berdan gun of 1866.

We conclude that the Government is using, in the Springfield gun, the ejector device covered by letters patent No. 88436, owned by plaintiffs.

As to the statute of limitations we see no reason to change the conclusions reached by us upon this subject in the case of Butler *vs.* The United States.

We are not prepared to render a final decision as to the liability of defendants for the use of the extractor device, without further proceedings, the nature of which is indicated in an order filed herewith remanding the cause.

41 VII.—*Order remanding case (filed May 19, 1890).*

This case is remanded to the general docket for the purposes indicated in the annexed memorandum.

MEMORANDUM.

The court desire to hear argument upon this question:

Whether the Government is liable upon the theory of an implied contract to compensate the plaintiffs for the ejector device in use upon the Springfield gun.

Also upon this question. In case the first question be answered in the affirmative, what should be the measure of plaintiff's recovery? As to this, further testimony may be taken by either party if desired.

Counsel are desired to indicate to the court the testimony tending to prove the following facts:

As to the Springfield model of 1866.

(a) When did the manufacture of this model begin?

(b) When did it cease?

(c) How many guns of this model manufactured and issued?

As to the Springfield model of 1868 and all subsequent Springfield models, but without distinguishing as to the different models, all being classed as though of the model of 1868.

(a) When did the manufacture begin?

(b) How many of these guns were manufactured and issued between the date when manufacture begun and the date six years prior to the beginning of this action?

(c) How many guns were so manufactured and issued between
42 this latter date and the date when the amended petition herein was filed?

(d) How many guns were so manufactured and issued between the date six years prior to the beginning of this action and the date when patent 88436 expired?

BY THE COURT.

43 VIII.—*Reargument and resubmission of case.*

This case was reargued by Mr. Boutwell and Mr. Berdan for claimant, and by Mr. Dewees for the defendants.

It was resubmitted November 5, 1890.

44 IX.—*Findings of fact (filed Dec. 8, 1890).*

This case having been heard by the Court of Claims, the court upon the evidence find the facts to be as follows.

I.

January 30, 1866, the Secretary of War issued an order for the meeting and organization of a board of officers of the Army, of which Maj. Gen. W. S. Hancock was named as president. This board, known as the Hancock board, was "ordered to examine thoroughly the following questions and make recommendations thereon:

"(1) What form and caliber of breech-loading arm should be adopted as a model for future construction of muskets for infantry?

"(2) What form and caliber should be adopted as a model for future construction of carbines for cavalry?

"(3) What form of breech-loading arm should be adopted as a model for changes of muskets, already constructed, to breech-loading muskets?

"Each person who submits an arm to the above board will be required to state in writing the lowest price at which it will be furnished in the event of its being adopted by the Government."

II.

This board met at Washington March 10, 1866; in the same month the board issued a circular to the public, with the following blank form of proposal, to be signed by those presenting arms for trials:

"———— ————, of ————, of ————, being the proprietor of the patent right to manufacture a breech-loading arm, known as ————, do hereby bind ———— heirs, executors, and assigns, do grant to the United States Government, if called on within three years from this date to make such grant, the right to manufacture the aforesaid breech-loading arm on the following terms, viz:

For payment to ———— of —— dollar per arm for the privilege of manufacturing fifty thousand; of —— dollar per arm for the privilege of manufacturing one hundred thousand; of —— dollar per arm for the privilege of manufacturing two hundred thousand; and of —— dollar per arm for the privilege of manufacturing any additional number of arms; provided, that when the Government shall have paid the total amount —— dollars, counting each and every payment, then it shall have the full and entire privilege of manufacturing ———— patented arms, for its own use, without further payment to ———— on account of ———— patent right. Each payment, as above specified, to be made for not less than five thousand arms. Or, by the payment of —— dollars within three years from this date, the privilege of manufacturing as many arms as may be desired shall be granted to the United States."

At this time the Government was using the "Allin device," sometimes called model of 1865, described in the schedule upon which were issued letters patent No. 49959.

45 III.

The Berdan Firearms Manufacturing Company, of New York, was then the owner of a certain patent granted by the United States for an improvement in firearms made by Hiram Berdan, namely, a patent issued February 27, 1866, and numbered 52925.

IV.

March 27, 1866, the Berdan Firearms Manufacturing Company delivered to the said board of officers the following communication:

"The Berdan Firearms Co., of New York, New York, being the proprietor of the patent right to manufacture a breech-loading arm known as the Berdan breechloader, do hereby bind ourselves, heirs, executors, and assigns, to grant to the United States Government, if called on within three years from this date to make such grant, the right to manufacture the aforesaid breech-loading arms on the following terms, viz:

"For payment to us of two dollars per arm for the privilege of manufacturing fifty thousand; of one and three-quarters dollars per arm for the privilege of manufacturing one hundred thousand; of one and one-half dollars per arm for privilege of manufacturing two hundred thousand; and of one and one-quarter dollars per arm for the privilege of manufacturing any additional number of arms; provided, that when the Government shall have paid to us the total amount of one million dollars, counting each and every payment, then it shall have the full and entire privilege of manufacturing patented arms for its own use without any

further payment to us on account of our patent right. Each payment as above specified to be made for not less than 5,000 arms, or, by the payment of eight hundred thousand dollars within three years from this date, the privilege of manufacturing as many arms as may be desired shall be granted to the United States. We have endeavored to name a price the payment of which, while giving the best gun, would also leave the United States Government much the gainer by the saving in the cost of alteration of the Springfield musket, or of the manufacture of a new gun on our plan over any other known to us; but if the price we have named is considered too high, we do not wish it to be understood that we will not consent to a reasonable reduction. Our offer embraces both or either gun presented by us.

"C. L. PERKINS,
"*President Beedan Firearms Co.*

"WASHINGTON, *March* 27, '66."

V.

About March 27, 1866, the said company presented to the said board of officers for their examination breech-loading guns and later presented a gun called No. 4, which was similar to the one described in the specifications and drawings of said letters patent No. 52925, except in the following particulars:

In the patent schedule the breechblock is shown as fastened to the barrel by a plate screwed to the top of the barrel; in the gun (No. 4) shown the board the plate was abandoned and the breechblock was fastened by a band around the barrel. As this fastening was more secure than the plate, held by screws screwed into the barrel, plaintiffs found it unnecessary, in the gun shown the board, to retain the locking device upon the forward end of the breechblock, by which a "boss" entered the rear of the barrel and held the forward end of the breech down during recoil. Plaintiffs also added in this gun, under the firingpin, a lip, which falls beneath the hammer when the breech is closed and the hammer is down, for the purpose of preventing the rear end of the brace from lifting during recoil; the device for that purpose shown in the patented gun was not efficient.

In the gun shown the Hancock board the following change from the patented gun appeared in the ejector device: The spur at the top
46 was retained; the hook was transferred from the bottom of the receiver to the left side and was a slight projection from the top of a U spring; this replaced a spiral spring shown in the patent as under the bottom of the receiver. The U spring was on the side of and outside the receiver, the hook operating through a slot in the side of the receiver parallel to the axis of the bore. In its normal condition (with the spring released) the hook was at the rear end of its slot. A friction plunger (which did not exist in the patented gun) was placed in the gun (No. 4) shown the Hancock board; this plunger appeared in the middle of the bottom of the breech-receiver, close to the barrel's mouth, and was so placed that when the gun was loaded the spring was held up against the cartridge head and in contact with it by a flat spring placed underneath the barrel. The friction plunger was introduced for the reason stated in Finding XIII.

VI.

In February, 1866, the following instrument was executed:

"Whereas I, Benjamin S. Roberts, of the United States Army, did obtain letters patent of the United States for certain improvements in breech-loading firearms, which letters patent bears date the twenty-third day of September, 1862, and are numbered 36531, which letters patent were issued in two divisions, September 5, 1865, and numbered, respectively, 2067 and 2068.

"And whereas Hiram Berdan, of the city of New York, is desirous of obtaining from me a license to use the retraction hook described in said reissue patent No. 2067, in any arm he may manufacture, with the right to vend to others the privilege of making, using, and vending said hook as hereinafter stated:

"Now, this indenture witnesseth, that for and in consideration of the sum of one hundred dollars to me, the said Benjamin S. Roberts, in hand paid, the receipt of which is hereby acknowledged, I have assigned, sold, and set over, and do hereby assign, sell, and set over, unto the said Hiram Berdan, the right to make, use, and vend the said retraction hook, and to authorize others to do the same in connection with any arm invented or patented by the said Berdan, or that may hereafter be invented or patented by him, the same to be held and enjoyed by the said Hiram Berdan for his own use and behoof, and for the use and behoof of his legal representatives, to the full end of the term for which said letters patent are granted, as fully and entirely as the same would have been held, enjoyed by me if this assignment and sale had not been made.

"In testimony whereof I hereunto set my hand and affix my seal this 15th day of February, 1866.

"[SEAL.] "BENJ. S. ROBERTS, *U. S. A.*

"Sealed and delivered in presence of—

"LAURA SPERRY.

"Received and recorded Feb'y 19th, 1866.—J. H. S."

VII.

The following letter from the inventor accompanied the gun (No. 4) presented to the Hancock board:

"EBBITT HOUSE, *Washington, D. C., May* 21, '66.

"COLONEL: I have the honor to submit for the consideration of the board gun No. 4, as a plan for altering the muskets into breechloaders; also a plan for making new muskets and carbines. This gun is substantially the same as gun No. 1 and 2, submitted by us sometime since. The principal improvements consist in the projection to the brace under the face of the hammer for the purpose of preventing the hammer from coming in contact with the firing pin until the breech piece is entirely locked, and from allowing the breech piece to be accidentally knocked open when the sear is in the safety notch; also in attaching the breech piece to the bbl. by a band, in place of screws and straps. We make no extra charge for these improvements.

"I am, col., very respectfully, your ob't serv't,

"H. BERDAN,

"*Vice-President of the Berdan F. A. Mf'g Co.*"

47

VIII.

June 4, 1866, the said board of officers concluded its labors and made a final report to the Secretary of War, which contained this recommendation and statement, namely:

"Fourth. This board recommends the plan of alteration submitted by H. Berdan. This gives the stable breech pin, secures the piece against premature discharge, and involves only a slight change of our present pattern of arms."

IX.

June 16, 1866, the Chief of Ordnance made a report upon this subject to the Secretary of War, in which, alluding to Berdan's gun and four others, he recommended that fifty of each be prepared at the Springfield Armory at the expense of the United States, and be so issued to troops that an equal number of each kind should be in the same company; that the arms should be thoroughly tested by the troops and that no plan for alteration should be adopted until after this test had been made. He also recommended the purchase of new arms to compare with the devices named (Berdan's among them) for altering the Springfield gun.

June 26, 1866, the lieutenant-general approved these recommendations except the proposition to place new patent arms in the hands of troops for trial. This he disapproved because there was a large number of muzzle-loading arms on hand capable of economical alterations. July 26, 1866, the Secretary of War issued the following order:

"WAR DEPARTMENT,
"*Washington City, July* 26, 1866.

"GENERAL: You are hereby directed to take immediate measures for the conversion of twenty-five thousand Springfield muskets into breech-loaders of the best pattern, and for the preparation of an adequate supply of ammunition for them.

"Your obedient servant,

"EDWIN M. STANTON,
"*Secretary of War.*

"Brevet Major-General A. B. DYER,
"*Chief of Ordnance, U. S. Army.*"

No gun has been bought by the Government from defendants and no gun has been manufactured by the Government which is a copy of the gun recommended by the Hancock board.

X.

July 21, 1868, said H. Berdan filed two applications in the Patent Office of the United States for improvements in breech-loading arms, for which patents were issued, namely: Patent dated March 30, 1869, numbered 88436, and patent dated April 5, 1870, and numbered 101418. These were duly assigned to plaintiffs.

XI.

In the Springfield gun (the official small arm of the U. S. Army) the breechblock is solid and fills all the breech chamber, except in this: it does not bear against the rear end of the chamber, and that end of the chamber is not intended to take up any part of the recoil, except upon the breech pin alone, as hereinafter shown.

48 The breechblock is fastened by a hinge at its forward end to the top of the barrel. The hinge pin is of less diameter than the hinge holes through which it passes, thus permitting some slight movement or play in the hinge so that the pin may not be cut during recoil.

There is a recess at the head of the breech pin; this recess is somewhat concave in form, and into this the cam latch locks; the shaft of the cam-latch hinge is smaller than the hinge holes through which it passes, and this shaft extends horizontally beyond the barrel, terminating in a handle or thumb latch, as shown in the Allin gun; when the breechblock is shut and locked this handle lies under the angle of the hammer and is so arranged that with the hammer in the third or lowest notch (or entirely down) the breechblock can not accidentally unlock and open. In locking or unlocking the cam latch this handle turns across the head of the firing-pin and thus operates to prevent premature firing as in the Allin gun.

In firing, the breechblock sets back under the force of the recoil; the loose hinge at the forward end gives play there; the loose hinge of the cam latch gives play at that point and the recoil is transmitted through the breechblock to the cam latch, with the head of which it comes in direct contact, and then through the cam latch to the head of the breech pin. By reason of the small diameters of the respective pins or shafts of the two hinges as compared to the hinge holes through which they pass no strain is brought upon these hinges by the recoil.

In Allin's gun the cam latch was simply a locking device, while in the Springfield gun it also takes up and transmits the recoil as did the brace in Berdan's gun of 1866.

In the Springfield gun the cam latch performs an additional and different office from Allin's cam latch. The hinge pin of the forward hinge and the cam-latch shaft are purposely made small and the hinge loose that the pin and shaft may not be subject to injury during recoil, and also to permit play; the horizontal elongation of the hinge-pin hole permits the breechblock to slide bodily backwards under the influence of the discharge; the cam abuts against the surface of its recess in the breechblock at one end and transmits the recoil from the surface of this recess at one end to the face of the breech screw at the other end without subjecting the shaft upon which it turns to any strain; by the elongation of the hinge-pin hole in the breech-block, and the intentional looseness of the cam shaft and arbor in the bearings, the transmission is effected (through the interposition of the cam) of the force of the recoil from the breechblock to the breech screw.

The bearing of the cam is above the center of the breech screw and its resistance consequently, through the resolution of the force of recoil, tends to press the rear end of the breechblock downwards. The front end of the block is secured against lifting (in case of escape of gas from the car-

tridge) by the engagement of the flanges at its top and forward end under ears made upon the receiver, substantially in the form used by Allin, and shown in the specifications and drawings upon which his patent issued.

Several models of Springfield arms have been placed in evidence, and as to them we find: The model of 1865 was the Allin gun. The model of 1866 (Finding XII) was a tight-jointed mechanism, and except for the ejector device, elsewhere described in these findings, the Berdan model has no bearing upon this case. The loose-jointed mechanism appeared
49 in 1868, with the new ejector device elsewhere in these findings described. For the purposes of this action the model of 1868 and those subsequent are alike, and for these purposes the description given in these findings of the Springfield gun applies to all models subsequent to that of 1866.

XII.

The Berdan gun (patent 52925) was not loose-jointed; when the breech-block was down there was no play, for then the block abutted against the barrel at one end and the brace against the breech-screw at the other; Berdan, by joining his block (making thus a block and brace), procured a square recoil shoulder against the end of the breech-pin; but he did not procure any play in the parts; there were elongated holes in the plate fastening of his breech-block, as shown in the Patent Office model, a device replaced in the gun shown the Hancock Board (No. 4) by a band which has a minute slip upon the barrel under strong pressure; but neither the holes nor the band are claimed to give, nor do they give, looseness of construction; they merely take up slight wear of the parts. It is admitted that no single element in patent 52925 is new. The combinations shown in claims 1, 2, 4, and 5 were novel and useful.

XIII.

The Berdan extractor (patent 52925) was intended for rim-fire cartridges; with those cartridges it was successful; it was not successful when used with center-fire cartridges, for this reason: The flange of the rim-fire cartridges expanded somewhat at the time of explosion, and the shell thus took a firm seat in the barrel. This expansion did not occur in the center-fire cartridgess, and therefore the shell was pressed back by the ejector spring in proportion to the speed with which the breech-block was raised; the movement thus communicated to the cartridge was therefore not sufficiently fast to throw the cartridge out of the receiver. To counteract this difficulty, Berdan introduced the friction plunger into the receiver just behind the cartridge-head, thus counteracting the backward pressure of the spring until the breech-block was open sufficiently to allow the shell to clear the face of the breech-block when ejected, so that the motion backward should not be impeded by the intervening breech-block. This friction plunger, singly or in combination, was not patented by Berdan.

It appears that the ejector in patent 52925 would only operate when a rim-fire cartridge was used. The Government uses center-fire cartridges.

The plunger shown in the Allin gun, and intended to eject the cartridge, did not work successfully in practice.

XIV.

In the model before the Hancock Board the following changes in the extractor device appeared: The spur at the top was retained; the hook was transferred from the bottom of the receiver to the left side, and was a projection from the upper end of a U-spring, the spiral spring being abandoned; a friction plunger was placed in the middle in the bottom of the receiver, held up against the cartridge head (when the gun was loaded) by a flat spring placed underneath the barrel. This has been shown in Finding V.

The Springfield gun of 1866 has a U-spring, a hook (which is a slight projection from the upper end of the spring); the hook runs in a slot at the side of the barrel; there is a spur attached to the hinge at the top, there is a friction plunger, and in place of the ways a deflecting stud is placed in the bottom of the breech-receiver. This ejector device, except for the omission of the "ways" and the substitution therefor of the beveled deflecting stud, is the device found in the gun submitted by Berdan to the Hancock Board. The "ways" and the beveled deflecting stud are mechanical equivalents.

In the Springfield gun of 1868 appears for the first time the extracting device since in use, and the hook, spur, and the friction plunger ceased to be used from that time.

XV.

After abandoning the unsuccessful Allin device for extraction and ejection, defendants took up Ball's device (Letters Patent No. 60654), known colloquially in the Government service as the Lamson extractor. This device was a failure for these reasons: The points would get dry between the ejector plate and the part of the spring movement upon it, and after comparatively few extractions the device would become worthless, a hole being worn through the plate; it wore out quickly and was apt to stick. The point of the spring was liable to stick against the ejector; the surface of the ejector became covered by a hard deposit from the smoke; against this the spring would not work. Smoot's device for an ejector is not shown to have been used or to be useful, and can not be successfully employed upon the Springfield gun.

XVI.

Extraction and ejection of cartridges was thus performed in all Springfield guns, beginning with the model of 1868, and continuing since.

Extraction: By an extractor plate swinging on the hinge-pin, and struck above its center of motion by the forward end of the breech-block near the completion of its movement in opening.

Ejection: By accelerating the movement of the extractor by means of a spiral ejector spring which surrounds the stem of the ejector spindle, and bears against the bottom of its hole in the receiver at one end, and against the head of the spindle at the other end. When the extractor is revolved by the opening of the block, the ejector spring is compressed by the ejector spindle, the point of which rests in a cavity in the back of the extractor above its axis of motion. The continued revolution of the extractor

finally brings the prolongation of the ejector spindle below the axis of motion; as soon as the center is passed the sudden release of the ejector spring causes the extractor to rapidly rotate about its axis, and to carry the empty cartridge shell against the beveled surface of the ejector stud, by which it is deflected upward and thrown clear of the gun.

This specific device was perfected by Benjamin F. Adams, an employé in the Springfield Armory. He invented it in the autumn of 1868.

51 XVII.

The extraction and ejection of cartridges was thus performed in the Russian-Berdan gun, patent No. 88436.

Extraction: By an extractor swinging on the joint screw and struck above its center of motion by the forward end of the breechblock near the completion of its movement in opening.

Ejection: By accelerating the movement of the extractor by the ejector spring, one end of which has a solid bearing on the hinge strap slide, and the other resting on the extractor above the center of motion, causes the spring to be compressed by the movement of the latter until the direction of the resistance passes below the center of motion; the sudden release of the spring then throws out the extractor, carrying with it the shell, which in passing out is deflected by the beveled surface of the ejector stud, and is thus thrown clear of the piece.

The only difference between the Berdan and Adams devices is that Berdan used a flat spring while the Government used a spiral spring with a spindle or plunger; both perform the same office and attain the same result in the same way; the use of the flat spring or of the spiral spring is matter of choice, and is in no way material to the result.

Adams, when he made his invention, was ignorant of Berdan's prior invention.

XVIII.

Letters patent, numbered as follows, were issued at the dates set forth and to the persons named, upon drawings, specifications, and claims, which are made part of these findings:

Hiram Berdan, No. 52925, February 27, 1866.

Hiram Berdan, No. 101418, April 5, 1870, antedated March 21, 1870.

Hiram Berdan, No. 88436, March 30, 1869.

The Berdan Firearms Manufacturing Company, assignees of Hiram Berdan, No. 51991; reissue No. 3117, January 9, 1866; reissue date September 15, 1868.

E. S. Allin, No. 49959, September 19, 1865.

Edward S. Wright, assignor to himself and George Brown, No. 45126, November 15, 1864. Antedated November 13, 1864.

Nathan S. Clement, No. 14949, May 27, 1856.

James W. Preston, assignor to A. B. Ely, No. 61865, February 5, 1867.

William W. Hubbell, No. 28486, May 29, 1860.

Isaac M. Milbank, No. 52734, February 20, 1866.

Frederic W. Howe, No. 46671, March 7, 1865.

Cyprien Chabot, No. 47163, April 4, 1865.

Benjamin S. Roberts, No. 36531, September 23, 1862. Reissue No. 2068, September 5, 1865.

Benjamin S. Roberts, No. 36531. Reissue No. 2067, September 23 1862. Reissue date September 5, 1865.

James Warner, No. 41732, February 23, 1864.

George P. Foster and George F. Foster, No. 49994, September 19, 1865.

Edward Maynard, No. 30537, October 30, 1860.

William S. Smoot, assignor to Windsor Manufacturing Company, No. 68250, August 27, 1867.

William W. Hubbell, No. 3649. Reissue No. 193, July 1, 1844. Reissue date March 11, 1851.

Samuel Strong, No. 38644, May 19, 1863.

Joseph and George Henry Needham, assignors to James Graham Grey, No. 64999, May 21, 1867.

W. Wheeler Hubbell, No. 65812, June 18, 1867.

Cyprien Chabot, No. 49718, September 5, 1865. Antedated June 15, 1865.

William H. Miller and G. W. Miller, No. 51739, December 26, 1865.

Benjamin S. Roberts, No. 52887, February 27, 1866.

Albert Ball, one-half assignor to Windsor Manufacturing Company, No. 60664, January 1, 1867.

52 John Webster Cochran, No. 39120, July 7, 1863.

Joseph Rider, assignor to himself and E. Remington and sons, No. 40887.

Benj. F. Joslyn, No. 39407, August 4, 1864.

H. O. Peabody, No. 35947, July 22, 1862.

Alfred B. Ely, assignee of Francis J. Vittum and Edgar M. Stevens, No. 33560; reissue No. 3653, October 22, 1861; reissue date September 28, 1869.

William H. Miller and George W. Miller, No. 68099, August 27, 1867.

William Morgenstern, No. 86434, February 2 1869.

William Morgenstern, No. 87190, February 23, 1869.

William Montstorm, No. 15507, July 8, 1856; reissue No. 2445, Division A, January 1, 1867; also reissue No. 2446, January 1, 1867.

Morgenstern's application for patent No. 86434 was made October 22, 1868.

Morgenstern's application for patent No. 87190 was made March 23, 1868.

Berdan's application for patent No. 88436 was made July 21, 1868.

XIX.

The War Department is early and regularly informed of all improvements and inventions in firearms and ammunition. It is aware of the state of the art at all times, and generally knows of all patents upon firearms as soon as issued.

The attitude of the War Department towards inventors in ordnance has been one of neutrality; it has neither denied nor admitted the legal rights, if any there were, of inventors; in an endeavor to perfect the Government arm that Department has taken advantage of all knowledge within its reach and of all inventions; it does not deny the claims of inventors, but has

proceeded upon the policy that executive officers should not decide upon such claims against the Government or upon conflicting claims, but that the claim should be presented without prejudice before some other tribunal than an Executive Department. Berdan, as an officer of plaintiffs herein, assignees of his inventions during the period covered by this action, was in constant communication with the ordnance officers, requesting the use of his devices by the Government; they knew him as an inventor and knew his inventions as soon as they were patented. In 1867, it was known that Berdan was at work upon an ejector, and in August, 1868, that he had applied for patents for improvements in firearms, but it does not appear that prior to issue of patent the ordnance officers knew of the specific devices protected by letters patent No. 88436, issued March 10, 1869, upon application filed July 21, 1868, except as hereinafter appears.

XX.

An examiner in the Patent Office, upon May 13, 1867, in the matter of the interference between the application of William S. Smoot and the patent of Albert Ball, for improvement in firearms, decided, upon evidence before him, that Smoot was the earlier inventor; said evidence as stated by said examiner showed that a model of the Smoot invention was made at the National Armory in January, 1865.

Berdan had in August, 1866, completed a gun containing his device.

XXI.

The following license was given as therein appears:

"LICENSE.

"Know all men by these presents, that in consideration of the sum of ten thousand dollars ($10,000) paid to me by warrant on the Treasury of the United States, I hereby grant, sell, and convey to the said United States the right and privilege to alter two thousand (2,000) of the muskets or rifles now belonging to the United States, according to a pattern to be fur-
53 nished by me, to correspond with the one furnished by me for trial by the board of ordnance officers, under the act of Congress approved 12th of June, 1858, and selected by said board on the 3d of August, 1858. This agreement to include all my patent privileges for 2,000 arms.

"Given under my hand and seal this 13th day of September, eighteen hundred and fifty-eight, at Washington, D. C.

"GEO. W. MORSE. [SEAL.]

"Signed and sealed in presence of—
"M. ALDER.
"JONAS P. KEELER."

[Indorsements on foregoing license.]

"Approved:

"JOHN B. FLOYD,
"*Sec'y of War.*

"WAR DEPART., *13th Sep'r*, 1858."

The following rates were given the Hancock board in 1866 by different patentees of firearms; rates at which the Government should be permitted to use their patented devices appearing in arms presented to that board in competition for adoption by the Government:

	1.	2.	3.	4	5.	6.
Berdan Firearms Co	$2.00	$1.75	$1.50	$1.25	$1,000,000	$800,000
National Arms	1.00	.80	.50	.40	750,000	750,000
Sharp's Rifle Mfg. Co	2.50	2.25	2.00	2.00	600,000	500,000
Poultney & Trimble	2.00	1.50	1.00	1.00	200,000	200,000
T. Poultney	2.00	1.50	1.00	1.00	200,000	200,000
Connecticut Arms Mfg	2.00	1.50	1.25	1.00	350,000	250,000
Thomas L. Starkevant	3.00	2.50	2.00	2.00	200,000	200,000
Merrill Pat. Firearms	1.00	1.00	1.00	1.00	500,000	500,000
W. H. & G. W. Miller	1.00	.75	.50	.....	100,000	100,000
The Meriden Mfg. Co	1.00	.75	.50	.25	100,000	100,000
Robertson & Simpson	1.00	1.00	1.00	1.00	400,000	500,000
Armstrong & Taylor	2.00	1.75	1.50	1.50	300,000	250,000
William Johnston	2.00	1.50	1.00	1.00	250,000	100,000
Empire B. L. Firearms	2.00	1.50	1.00	.50	500,000	500,000
Henry Underwood & Co	1.00	.75	.50	.25	100,000	80,000
Bethel Burton	2.00	1.00	1.00	1.00	100,000	100,000
L. Triplett & W. T. Scott	3.00	2.50	2.00	2.00	.....	.....
E. G. Lamson	2.00	1.50	1.00	1.00	250,000	200,000
Undersigned residents, Boston	1.50	1.25	1.00	.....	200,000	200,000
Oliver F. Winchester	4.00	3.00	2.00	1.00	500,000	350,000
E. Wright & G. Brown	.50	.37½	.25	.25	51,000	15,000
H. W. Hayden	1.00	.75	.50	.....	100,000	75,000
Hiram W. Hayden	1.00	.75	.50	.....	100,000	75,000
Warren Fisher	3.00	3.00	3.00	3.00	500,000	500,000
Burnside Rifle Co	2.00	1.25	1.12½	1.00	125,000	100,000
Webster Cochran	2.50	2.50	2.00	2.00	.....	.....
S. S. Bucklin & Co	1.00	.50	.50	.50	150,000	150,000
Wm. Wheeler Hubbell	1.00	1.00	1.00	1.00	300,000	250,000
Morganstern & Wilstach	1.00	.75	.50	.50	125,000	100,000
Colt's Pat. Firearms	1.00	.75	.50	.25	100,000	100,000
Howe & Jacobs	1.00	.50	.25	.....	50,000	50,000
John Burk	2.00	1.50	1.00	.50	400,000	200,000
E. Remington & Sons	.50	.40	.30	.25	100,000	50,000
E. Remingtons & Sons	.75	.50	.25	.25	250,000	75,000
Providence Tool Co	1.00	1.00	1.00	.....	200,000	200,000
Barton H. Jenks	1.00	1.00	1.00	1.00	.....	200,000
Benj. S. Roberts	.....	.....	0.25	0.20	20,000	20,000
J. Elwood Norny	1.50	1.00	1.00	1.00	400,000	300,000
F. Remington & Sons	.80	.55	.30	.25	150,000	60,000
John H. Selkrey	1.00	.50	.25	.25	50,000	30,000
Mix, Norton, Selkrey & Co	.40	.25	.30	.25	50,000	20,000
Eli Terry	1.00	.75	.50	.30	50,000	40,000
S. S. Bucklin & Co	1.00	.50	.50	.50	150,000	150,000
H. Berdan	.24	.24	.24	.24	250,000	100,000
Barton H. Jenks	2.50	2.00	1.25	1.00	300,000	300,000
Barton H. Jenks	2.50	2.00	1.25	1.00	300,000	300,000
F. W. Howe	1.00	1.00	1.00	.50	200,000	150,000
M. Y. Chick	.50	.50	.25	.....	50,000	50,000
John B. Anthony	1.00	1.00	.75	.50	250,000	200,000
Leroy S. White	.75	.50	.25	.12	50,000	25,000
Henry H. Wolcott	1.00	1.00	1.00	1.00	250,000	250,000
W. X. Stephens	2.50	1.00	.50	.....	100,000	100,000
Edward Maynard	1.00	1.00	1.00	1.00	500,000	300,000
E. Wright & G. Brown	1.00	.75	.50	.25	150,000	100,000
Warren Fisher	3.00	3.00	3.00	3.00	600,000	600,000
W. F. Wilson & F. Lather	.50	.50	.40	.30	75,000	75,000

Where the names appear in duplicate the proposals are for different kinds of arms.

54 The royalty paid the Remingtons for a gun made by them was 50 cents per gun; of these guns some 600,000 were sold in Europe. How this gun was constructed or how it or any part or parts of it were protected by patents does not appear.

XXII.

It does not appear that plaintiff's or Berdan have manufactured for sale any muskets containing the extractor-ejector device (patent No. 88436) or that muskets have been manufactured under this patent, or that licenses to

manufacture arms containing this device have been sold except as hereinafter set forth. The extractor-ejector device found upon the Springfield musket, which is alleged by the plaintiffs to be covered by their patent No. 88436, is a most efficient, useful, and valuable device, believed by army officers to be the best known in the art for use in a single-fire military arm of the Springfield type. It is far superior to the Allin extractor-ejector device previously in use upon the army musket. The cost of manufacturing the extractor-ejector now in use (since 1868) is $1.25 per gun less than the cost of manufacturing the Allin device.

Several witnesses of high military position, experts in the practical use of arms of this description and familiar with the cost of manufacture, have testified to the great value of the extractor-ejector device, claimed to be covered (and understood by them to be covered) by patent No. 88436, and they are of the opinion that a reasonable royalty for the use of this device would be the saving in cost over the Allin device plus a sum, varying somewhat with each witness, but of which the average is $1.41⅔ per musket, thus giving as royalty the sum of $2.66⅔ per musket. It does not appear upon what facts these witnesses based their opinions, or that they were cognizant of facts in relation to sales or licenses of this or other similar inventions upon which to found their opinions.

The Colt Arms Company paid Lamson, owner of the Ball device, for the purpose of protecting the ejector device in three thousand guns manufactured by them, the sum of 10 cents per gun; this payment, however, was in the nature of a compromise to avoid risk of litigation; it does not appear that the Lamson-Ball device was, in fact, put into any of these guns.

A contract was made by plaintiffs with the Russian Government to furnish muskets containing the device covered by patent No. 88436, but what royalty was paid by said Government does not sufficiently appear.

William H. and Geo. W. Miller, January 6, 1868, licensed plaintiffs to use their patented device (patent of December 26, 1865, reissue October 1, 1867) for the sum of $2,500, to be paid as follows:

"Twenty-five hundred dollars when a contract shall be signed for the sale of 30,000 guns with the Russian Government, and at the rate of 10 cents per arm in advance when contracts for other arms the patents of which are owned by the Berdan Arms Company shall be signed, until the whole amount shall be paid."

Said Millers settled with defendants for alleged infringement of their invention in the sum of $20,000.

In a negotiation with the Spanish Government for guns containing this Berdan extractor-ejector the following compensation was paid: For 30,000 guns plaintiffs received $60,000 in cash and an order for ten millions of cartridge cases, which netted them $2.50 per thousand (or about $25,000) for the cartridges, and also an order for a set of machinery for making cartridge cases, for which they received, as profit, about $5,000.

This contract was made, however, upon the understanding that the royalty for the gun should be $2.50 per musket, while, for reasons of policy, the price of the muskets was reduced, the price of the cartridges being correspondingly increased; but it also appears that the ejector-extractor was not alone contemplated in this contract, there being other devices in the Spanish gun claimed by plaintiffs to be protected by their patents. (See, also, Findings IV and XXI.)

The cost of manufacturing the Springfield rifles during the fiscal years ended June 30, was as follows: 1882, $12.72; 1883, $12.52; 1884, $12; 1885, $11.88. Upon the foregoing facts and circumstances (including said Findings IV and XXI), but without there being other evidence in the case, the court find the ultimate fact that 5 per cent upon the lowest cost of manufacturing the musket during the period covered by this action, as they construe the statute of limitations, was a fair and reasonable royalty for the right to manufacture and use the extractor-ejector device covered by patent No. 88436.

XXIII.

In 1867, during the autumn, Berdan showed to Colonel Benton, commandant of the Springfield Armory, at the armory, a transformed musket, containing the extractor-ejector subsequently described in the specifications and claims of patent number 88436; Colonel Benton then and there examined and tested the device; he neither approved or disapproved it; his attitude was neutral.

August 3 or 4, 1889, Berdan had a conversation with General Dyer, then Chief of Ordnance, in the Ordnance Office, upon the subject of his devices. During this conversation the Chief of Ordnance said, in substance, that he had recommended that some steps should be taken or some court constituted for the purpose of determining the value of the various claims for devices used in the Springfield gun, the army officers (in his opinion, he said) being powerless to settle the question.

Berdan's application for patent No. 88436 was then pending in the Patent Office and Berdan explained generally its features. The Chief of Ordnance said, in substance, that if any of the features should be used by defendants in the Springfield gun the ordnance officers expected to pay for them when the claimant had gone through the proper channels and settled the claim.

While this application for patent 88436 was pending in the Patent Office the following letters were written:

"WASHINGTON, *August 3*, 1868.

"GENERAL: I hold some patents on the system of converting muzzle-loading muskets into breechloaders, recently adopted by the United States. I am also the inventor of other points in the same system not yet patented, but applications for which have been made some time since, and I am now informed that the business of this branch of the Patent Office is some five months behindhand, and that my application would be acted upon at once on a receipt of a note from the Department that it is desirable that these applications should be disposed of to enable me to present my claim to the Government for the use of said patent.

"Trusting that you will grant me this favor,

"I am, very respectfully, your obedient servant,

"H. BERDAN.

"Bvt. Maj. Gen. A. B. DYER,
Chief of Ordnance."

56 "WAR DEPARTMENT, WASHINGTON CITY,
"*August* 12, 1868.

"SIR: I have the honor to transmit herewith a communication, dated the 3d instant, from H. Berdan, asking that his application for patents for various improvements in firearms be acted upon immediately by the Patent Office, in order that he may present his claims against this Department for its use of said inventions, and to state that so far as this Department is concerned the early consideration of the aforesaid claims is regarded as being desirable.

"Very respectfully, your obedient servant,

"J. M. SCHOFIELD,
"*Secretary of War.*

"The honorable the SECRETARY OF THE INTERIOR."

September 25, 1868, Colonel Benton wrote to the Chief of Ordnance a letter, from which the following is an extract:

"NATIONAL ARMORY,
"*Springfield, Mass., Sept.* 25, '68.

"Gen'l A. B. DYER,
"*Chief of Ordnance, Washington, D. C.:*

"SIR: I have this day sent to your address, by express, a box containing a rifle musket, altered to a breechloader on the plan of 1868, and a wooden model of the same with a spiral-spring extractor.

"The specimen gun is arranged so that either the flat spring or the spiral-spring extractor may be used for the purpose of testing the merits of both.

"This gun has been fired about 5,000 times—3,700 with the spiral-spring extractor. Both the extractors worked well throughout and either would, in my opinion, be suitable for the service.

"The spiral-spring extractor has the advantage of being cheaper to make and to be better protected from dirt and moisture. The other one is more accessible in case of accidents.

"Not having any authority to make any changes, the models are being made for the flat spring. Mr. Adams, one of our workmen, suggested the peculiar arrangement of the spiral spring."

* * * * * * *

The Chief of Ordnance answered Colonel Benton by a letter from which the following is an extract:

"ORDNANCE OFFICE, WAR DEPARTMENT,
"*Washington, Sept.* 28, 1868.

"Bt Col. J. G. BENTON,
"*Com'd'g Springfield Armory:*

"SIR: The altered rifle musket and the wooden model of the same, referred to in your letter of the 25th inst., have been received and examined, and are returned by express, as requested by you.

* * * * * * *

"The addition of the plunger to work between the spiral spring and the cam is believed to be an improvement, and you are authorized to introduce it if you should become satisfied that it is a desirable change.

"The other changes mentioned in your letter will not be made.

"Respectfully, your obedient servant,

"A. B. DYER,
"*Bt Maj. Gen., Chief of Ordnance.*"

The following letter was subsequently written:

"ORDNANCE OFFICE, WAR DEPARTMENT,
"*Washington, Nov.* 12, 1868.

"Bvt. Col. J. G. BENTON,
"*Commanding Springfield Armory:*

"SIR: The model converted musket, which accompanied your letter of 2d inst., will be returned to you by this day's express.

"The Secretary of War has approved of the spiral-spring ejector which you have adapted to this gun, and the number of muskets you are authorized to alter will be altered to conform to this model.

"Respectfully, your obd't serv't,

"T. J. TREADWELL,
"*Bet. Lt. Col. & Maj. of Ord., in charge.*"

57 The following correspondence took place between Berdan and the commandant of the Springfield Arsenal:

"HÔTEL DE L'EUROPE,
"*Lucerne, June 7th,* 1876.

"MY DEAR COLONEL: I think of going to America about the 1st of Sept., partly to see the exhibition, but principally to see if something can't be got from the Govt. for the use of my patent on ejecting the shell by the power of a spring.

"I have not forgotten your kind promise to do what you could to help me to get a reward, as I was the first to present such an ejector to the commission.

"My object in going over is to effect some sort of a compromise, if possible, since all efforts in other directions have failed during ten years, and as I should count very much on your valuable assistance (rendered so not only in consequence of your having been on the commission, but for the reason that you are in charge of the armory at the present time), I write to enquire as to whether or no you will be on duty during the months of Sept. and October, so that the Govt. could get a report from you in case the Secretary of War desired to do so. If you can give me any suggestions as to the best way to proceed to effect an amicable settlement, I would not only regard them as strictly confidential, but would be extremely obliged to you, my dear Col., for them. Up to the present time the case has been in the hands of a lawyer, and is, I believe, before the Court of Claims.

"I will bring with me a range-finder, which from present appearances will soon be adopted by the Prussian Govt.

"Very truly, yours,

"BERDAN."

"NATIONAL ARMORY,
"*Springfield, Mass., June 22d*, 1876.

"Genl. H. BERDAN,
"*Hôtel de l'Europe, Lucerne, Switzerland:*

"DEAR SIR: Your letter of the 7th inst. is received.

"It is not in my power to render you any assistance in the prosecution of your claim for royalty on the extractor of the Springfield rifle further than to inform you that it has been the practice of the War Dept. in similar cases to refer them to the United States courts. It is understood that the Court of Claims has not the power to investigate the validity of patents. There are two suits now pending in the United States courts against myself as the agent of the Government for infringing in the use of the extractor. I understand that other claims exist and may be prosecuted in like manner.

"It is important, therefore, that some competent tribunal should decide on the legality of these claims that there may be no conflict, and that exact justice should be done in this matter.

"Your proper course will be to make your claim known to the Chief of Ordnance, who will do what is right and proper.

"Your obt. servt.,

"J. G. BENTON,
"*Lt. Col.*"

The Berdan extractor and ejector device (patent 88436) was exhibited in competition with other guns to a board of officers detailed to test guns and called the "Terry Board," in the year 1873; in the report of that board the device was fully described. General Benét became Chief of Ordnance in June, 1874, and has since held this position; he understood the Springfield device for extracting and ejecting the shell, as described in the "Terry" report, as "seemingly identical, certainly the mechanical equivalent," of Berdan's device for the same subject, covered by patent 88436. After the decision of the case of McKeever versus The United States in this court (December term, 1878, 14 C. Cls. R., p. 396) General Benét has been of this "decided opinion:"

"First. That the Supreme Court having given the opinion in the case of Seymour vs. Osburne (11 Wallace U. S. S. C. Reports, p. 533),
58 that "inventions secured by letters patent are property in the holder of the patent, and are as much entitled to protection as any other property, consisting of a franchise during the terms for which the franchise or the exclusive right is granted;" that patent rights are private property and can not be taken by the United States without due compensation; and,

"Second. That a use of an invention protected by a patent is the use of private property that must be paid for, and, therefore, an implied contract that has a place in court, and that if the validity of the patent is sustained, and its use by the Government is proved to the satisfaction of the court, the inventor must be paid."

General Benét, "with this understanding," continued the manufacture of the Springfield gun, containing the disputed ejector and extractor device, after adjournment of the "Terry Board," with the expectation that if the court sustained a claim by Berdan against the Government upon his pat-

ent No. 88436, then the Government must pay him for the use of his invention. Plaintiffs have desired that the Government should use their patented devices and have also desired and requested compensation for such use.

Upon the foregoing facts the court find that since 1874 the Berdan extractor-ejector device (described in patent No. 88436) has been used by defendants' ordnance officers knowingly and without claim of adverse right, believing the device in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by said letters patent, and with the anticipation that should the understanding of the said ordnance officers as to plaintiff's rights be judicially decided to be correct the defendant would compensate plaintiffs for such use.

XXIV.

Manufacture of Springfield model 1866 began in September, 1866, and ceased July 27, 1869. Of this model, 52627 there were manufactured muskets. Manufacture of the model of 1868 (including all subsequent models, which for the purpose of this action do not differ) began in January, 1869; of these guns there were manufactured from January, 1869, and the date six years prior to the beginning of this action, to wit, July 26, 1881, 224,952 muskets; between July 26, 1881, and the expiration of the patent there were manufactured 159,940 muskets.

XXV.

The following models were examined by the court during the trial of this cause:

Springfield models 1865, 1866, 1868, 1870, 1873, and 1884.
Berdan model gun from Patent Office of No. 52925.
Roberts models from Patent Office, patents 1862 and 1866.
Hubbell model gun of 1844 from Patent Office.
Hubbell model of 1860 from Patent Office.
Hubbel model No. 2.
Wright gun.
Guns of George W. Morse, two from Ordnance Office, and one referred to in testimony of Mr. Hubbell.
Millbank model from Patent Office.
English muzzel-loader.
Springfield breech mechanism 1865, 1866, 1868.
Berdan model from Patent Office, January 9, 1866.
Berdan gun, 2, E. F.
Russian Berdan, No. 1.
Bridgeport Berdan gun, No. 1.
Bridgeport Berdan gun, No. 2.
Remington gun, breech action.
Models of guns patented by Berdan or mentioned in these findings.

Except as incorporated in the foregoing findings, all requests for findings of fact, by either party, are denied.

XXVI.

After stopping the manufacture of the Allen device the model of 1866 was adopted, and 52,926 guns were manufactured in accordance therewith. The Lamson ejector was never manufactured for service.

CONCLUSION OF LAW.

Upon the foregoing facts the court find as conclusion of law that plaintiffs recover the sum of $95,004.36.

59 X.—*Proceedings to complete record on appeal.*

1.—*Motion by defendants to strike out the testimony of S. V. Benet and others. Filed November 6, 1890.*

And now, to wit, November 5, 1890, comes the Attorney-General in behalf of the United States and moves that the following testimony offered by claimants, so far as the same relates to the mechanical and alleged patented devices in controversy in this suit, and as to estimates of the value of the alleged use or infringements thereof by the United States, be striken from the record as incompetent, viz:

The testimony of Col. James Madison Whittemore.

The testimony of Col. William B. Royal.

The testimony of Lieut. Col. Stanhope E. Blunt.

The testimony of Gen. John C. Kelton.

The testimony of Stephen V. Benet.

Neither of these witnesses has laid the proper foundation to be examined as either patent, mechanical, or commercial experts in the value of patented devices.

The witnesses are all army officers and have been so since boyhood.

With the exception of Col. Whittemore they have never been engaged professionally or otherwise in the examination of patents or patented devices; have not studied professionally or otherwise what are claimed to be patented devices in this suit for the purpose of understanding the
60 extent of the claim, or as to whether such claim or claims have any validity, or, if any, what validity in view of the state of the art, or anticipating patents or devices.

The sole claim of Col. J. M. Whittemore to testify as a patent expert rests in the fact that he testifies to have invented a gun.

It is no part of the professional duty of either of the witnesses as army officers to examine patents, or to determine the commercial value of patented devices.

Neither of the witnesses are scientific mechanical experts and neither of them claim to be. Neither of the witnesses have been or are manufacturers.

Neither of the witnesses have been or are mechanics.

Neither of the witnesses have been or are engaged in commercial pursuits.

Neither of the witnesses have been or are engaged in the purchase or sale of patents, patent rights, or patented devices.

JOHN B. COTTON,
Assistant Attorney-General.

ORDER: Overruled by order of court.

WILLIAM A. RICHARDSON,
Chief Justice.

61 2.—*Request of defendants to amend findings and for additional findings of fact.—Filed December* 19, 1890.

And now comes the Attorney-General and asks that the findings of fact be amended in the particulars shown in statement filed herewith, and that the additional findings of fact there requested be found.

JOHN B. COTTON,
Assistant Attorney-General.

I.

Request XV is a mistake.

After stopping the manufacture to the Allin device the model of 1866 was adopted and 52,926 guns manufactured in accordance therewith. (Rec. 19). The Lamson ejector was never manufactured for service.

II.

Request XVII.

It is a mistake to say that the only difference between the Berdan and the Adams devices is that Berdan used a flat spring while the Government used a spiral spring. The Government device is a spiral spring with a spindle. It is an essential difference. (Porter, Adams, Exhibits Hubbell and McIntire.)

III.

The following amendment should be made to XXII. General Berdan, at the time the Colts Firearms Co. was manufacturing under contract with the Russian Government, offered to said company "a license to manufacture his guns at $1 each, less such royalties as they were obliged
62 to pay other parties for infringement," which offer was not accepted. Rec. 1039, 2–14 (and page 1044, q. 31 to 34).

IV.

To Request XVIII, I desire added file-wrapper and contents. H. Berdan, 88436, and 51991.

Benjamin S. Roberts, No. 52887.

William Morganstern, No. 88434 and 87190.

V.

The following additional finding is requested:

Neither the Ordnance Bureau nor its officers are authorized by law to purchase patent rights. (Rec., 493, 26.)

VI.

General Benét, Chief of Ordnance, never engaged in the purchase or sale of patent rights. He is not an expert in construction of patents. He was never engaged in the manufacture of guns. He has never made the subject of patents a special study (Rec., p. 493, 2, 25; Rec., 497, Q. 30 to 35), has not studied the details of construction of Berdan's patents. (Rec., 499, 242, 43; Rec., 508, Q. 113, 114.)

Gen. J. C. Kelton has never been on any board for examination of arms for infantry; his entire business has been in the Army; never engaged in purchase or sale of patents. (Rec., p. 259.)

Col. Jas. Madison Whittemore is an officer of the Army; he has invented several guns; never examined any patent for the purpose of seeing whether Berdan's claims had been anticipated. He has never been on any of the boards appointed to select guns. Never engaged in purchase or sale of patent rights. (Rec., pp. 308, 309.)

63 Col. W. B. Royal, cavalry officer U. S. A., was never engaged in manufacture of firearms, or in the purchase and sale of patented devices, or officially called upon to determine the value of royalties to be paid. (Rec., 77, Q. 56.)

Lt. Col. Blount, Capt. of Ordnance, U. S. A., has no knowledge of manufacturing guns (Rec., 81), knows nothing of the purchase or sale of guns, nor of value to be paid for royalty.

64 3.—*Conclusions on request of defendants to amend findings and for additional findings of fact. Filed by the court January* 26, 1891.

After considering the requests to amend findings, and for additional findings in the above-entitled cause, filed by defendants' counsel December 19, 1890, the court order as follows:

Finding XVII is amended nunc pro tunc as of December 8, 1891, by inserting in the last paragraph but one the words "with a spindle or plunger" after the words "while the Government used a 'spiral spring.'"

Request No. I. This is immaterial. Denied.

Request No. II. Allowed as above found.

Request III is denied, as the evidence is not deemed sufficient to support it.

Request IV is denied: The voluminous documents suggested to be found are deemed immaterial; at the *the* most they are in their nature merely evidence of a fact and, therefore, can not be included in the findings. (Clause 2, Rule I, rules Supreme Court, relating to appeals from the Court of Claims.)

Request V denied. The finding requested is of law.

Request VI denied. The ultimate fact is already found.

65 4.—*Motion of defendants to complete record on appeal. Filed March* 16, 1891.

And now comes the Attorney-General and respectfully represents to said court that the transcript of record in said case, as prepared by the clerk, is incomplete, in this:

1st. That the motion of November 5, 1890, to strike from the record testimony offered by claimants as incompetent, is omitted, to wit, the testimony of Col. James Madison Whittemore, Col. William B. Royal, Lieut. Col. Stanhope E. Blunt, Gen. John C. Kelton, and Gen. Stephen V. Benét, so far as the same relates to the mechanical and alleged patented devices in controversy in this suit, and as to the estimates of the value of the alleged use or infring'ments thereof by the United States.

2d. Decree of the court overruling said motion, omitted.

3rd. Motion is omitted, filed December 19, 1890. Request on part of defendant to amend findings of fact, and for additional findings of fact, together with the forwarding to Supreme Court of additional exhibits.

4th. Decree of court relative to such motion is omitted.

The said motions and decrees of this court thereon are deemed essential to the proper consideration of the case by the Supreme Court.

Therefore, the Attorney-General moves that this court directs its said clerk to add to the transcript of record copies of the said motions
66 and decrees, copies whereof are herewith presented.

JOHN B. COTTON,
Assistant Attorney-General.

ORDER: This motion is allowed by the court.

WILLIAM A. RICHARDSON,
Chief Justice.

APRIL 6, 1891.

67 5.—*Order for additional findings, April 6, 1891.*

Upon motion of defendants it is ordered that the findings of fact herein be, and the same hereby are, amended nunc pro tunc as if the day when the same were filed, by adding thereto the following additional findings, to wit:

"After stopping the manufacture of the Allin device the model of 1866 was adopted and 52,926 guns were manufactured in accordance therewith. The Lamson ejector was never manufactured for service."

68 X.—*Opinion of the court. Filed Dec. 8, 1890.*

DAVIS, J., delivered the opinion of the court:

An opinion has already been read in this case, in which plaintiffs' several patented devices for improvements in military arms were discussed, and the conclusion was reached that one of these, that for extracting and ejecting the shell after firing, is found in the Springfield musket. Further proceedings were directed to be taken in accordance with a memorandum handed down with the order remanding the cause. The case is now resubmitted in accordance with the terms of the order and memorandum.

At the second hearing defendants introduced patents which were not before called to our attention, and which, it is claimed, anticipate plaintiffs' extractor-ejector device. Defendants' counsel have also again urged upon our consideration the patent of W. S. Smoot (No. 68250), which we described and discussed in our former opinion. We see no reason upon a reëxamination of this last-named invention to change the opinion heretofore expressed by us in regard to it; in fact, the model lately submitted tends to show more strongly that the device lacks the simplicity of the Springfield or Berdan ejector, and that it would, apparently, be more susceptible than either of them to the effects of dust and dampness; that it would be more easily injured by accident, and would require greater care and attention. All of these criticisms show defects which in an army musket are serious. As to this, however, we are without the benefit of any evi-

dence of practical experience in the use of the ejector and our suggestions remain merely matters of opinion founded upon an examination of the patent and the model. The Smoot patent is very broad in character; the claim is for "a cartridge-extractor swinging loosely on a common center with that of the carrier or breechblock when said extractor, after being gradually operated by swinging the said block, is made to take on by any means a suddenly accelerated movement to extract the shell, without accelerating the movement of the block itself by which the extractor is operated." The claim is very broad; it covers the whole scheme of cartridge ejection; there is in it no limitation to any specific device; on the contrary, it covers "any means" which shall give a suddenly accelerated movement to the shell without regard to the details of the mechanism employed for that purpose.

There is nothing in the Smoot invention which is in any sense a discovery and there is nothing of this nature in any of the extractors shown to us. It was admitted and is shown by the many devices before us that a suddenly accelerated motion to the shell was generally assumed to be necessary; the principle was not new; what was sought and what was patentable was the mechanical combination which could successfully accomplish the desired result in a military arm exposed to the weather and dirt in unskillful, anxious, and busy hands. All extractor inventions have had the same aim, which is but the application of known methods to a known result; all that remained for a patent was the mechanical combination. Smoot claimed a result which inventors in firearms were then striving to obtain, to wit, the suddenly accelerated motion imparted to the shell after it had been loosened in the bore and when the way should be clear for its sharp ejection rearwards. We are not called upon for the purpose of this case to decide whether this claim is so broad as to make void the patent, or whether the claim is limited to the particular device described in the specifications, and these specifications are so broad in their description as to cover almost any possible extractor which shall at first loosen the shell and then suddenly eject it; for example, as an extractor Smoot in his specifications makes his breechblock swing—

69

"Both in conjunction with and also independently of the extractor, to impart a suddenly accelerated movement without restricting myself to a block opening upward or downward or otherwise. As a spring ejector in addition thereto it is of the essence of my invention to impart a suddenly accelerated movement to the extractor, whether rotated on the axle of the breechblock or otherwise, as may be the more convenient for the play of the operating spring. This spring to perform its functions may, as seen in the drawings, be made to react by passing the center of the extractor, acting endwise thereto, by link or other familiar attachment, or it may be made to pass under or over the same and react by striking into a notch, or it may be made to act otherwise, so only that by its reaction the extractor is made to take on suddenly accelerated movement."

It is difficult to imagine a broader specification; it is intended to cover what the claimant claims, namely, any method of imparting suddenly accelerated movement to the shell. The details of the particular method described for attaining this result are not those found in the Springfield gun or the Berdan device, nor is the claim limited to the details described by any such words as "substantially as described" or "substantially as set forth."

(Burr vs. Duryee, 1 Wallace, 531; Case vs. Brown, 2 Wallace, 320; Seymour vs. Osborn, 11 Wallace, 516; Dedrick vs. Seignund, Official Gazette, vol. 52, No. 10, p. 1537; The Corn Planter Patent, 23 Wallace, 181.)

It is not for us to decide whether the Smoot patent is or is not valid; we have only to see whether the device anticipated Berdan's or anticipated the device found in the Springfield arm; we are still of opinion that it did not.

Morgenstern's patent No. 86434 is dated February 2, 1869, but it was applied for October 22, 1868; Berdan's application for patent No. 88436 was filed July 21, 1868, three months in advance of Morgenstern; this patent No. 86434 may therefore be laid outside the case, and we shall consider the other patent, No. 87190. Here is found a device much more similar to that of Berdan or the Springfield rifle than any of the many others which have been brought to our notice; it may be thus described: There is a set screw lying horizontally upon the top of the gun barrel, just forward of the receiving chamber, its head pointing towards the muzzle of the gun; the after part of this set screw is in the form of a cone, its apex being near the ejector plate, but with a space between them; around this cone is wound a wire following the shape of the cone and so constituting a volute spring; the apex of the cone points to the center of the ejector plate, and the cone is immovable, except that through the screw it may be forced forward or back in a line with the bore of the gun; it has no movement at any angle with the plane of the bore; after leaving the apex of the cone the volute spring continues in the same form a short distance, when its end is straightened out and strikes the ejector plate substantially in a line with the apex of the cone. The inventor says as to this in his specifications:

"The volute spring 6 * * presses against the extractor W in such manner before said extractor is moved by the swinging breechblock * * as to tend to retain said extractor in the position seen in Fig. 1, but after the said extractor has been turned so far on its axis as to bring the point against which spring 6 bears below a right line passing through said axis and the center of screw J, the said spring presses upon the said extractor in such a manner as to force the extractor into the position illustrated at Fig. 2."

It would seem from this description that when the breechblock was closed the point of the spring rested somewhat above the center of the extractor plate, and by the turning of the plate, through the opening of the breechblock, was brought slowly past the center, when, being released, it shot downward and backward. That part of the spring which projects beyond the cone is unsupported either internally by a mandrel or externally by a casing; the spring therefore lacks strength and durability; it has a tendency under pressure to buckle or to take the form of a bow. This difficulty was apparently appreciated by the inventor, as in his succeeding patent he adopted a different device.

Morgenstern's claim upon this branch of his patent was as follows:

"In combination with the ejector W the spiral spring 6 and set screw J, the whole arranged to operate substantially as and for the purpose set forth."

His combination is of three parts, the ejector, spiral spring, and set screw. As we have seen, in the then state of the art this claim is a narrow one to be strictly construed. The inventor himself emphasized the importance of the set screw in his specifications, where he said "the object and advantage of the set screw J are to increase the effectiveness, as it (the spring) loses its elasticity, or as circumstances may require," and he adds that in case the spring should break it may still be made to act "by crowding the portions together by the screw J." As to the spring, he preferred one in a volute form, but added this: "A plain spiral spring may be employed with its end properly straightened out to act on the ejector W." So Morgenstern regarded as valuable and important to his combination, the set screw, and he left, in any contingency, a portion of his spring in such form that it would be subject to bow or buckle under pressure. The arrangement of the set screw and spring are vital elements of the Morgenstern combination.

The difference between the various devices intended to produce successful extraction and ejection of the cartridge produced in the years just succeeding the war were most minute, and to the layman who now examines them for the first time it might well seem doubtful whether, given the one unsuccessful invention, a skilled workman could not have manufactured the other successful invention without the exercise of any inventive genius. But the many patents issued covering such devices show a general effort to accomplish the desired result by methods sub-
71 stantially similar and differing only in apparently trifling details.

These details, however insignificant they may have appeared at the time to one not familiar with the art, were then evidently deemed important by experts, as is shown by the many patents applied for and the many patents granted. It does not appear in this case that any practically successful extractor-ejector for a rifle of the Springfield type was produced in advance of the Berdan or Adams device. The differences between the many inventions were slight. The successful device is simple in construction and much resembles the others, as they resemble each other; but changes as slight as those found in this device, when compared with others, are found in the other devices when compared with each other.

Morgenstern, Smoot, Ball, and the rest produced interesting inventions not very unlike in mechanical construction, yet each held by the proper authority to be patentable, and none so far as we have been shown has proved to be successful in practical use. Slight changes in the detail of arrangement were important to success in a device of so fine and delicate adjustment, which must nevertheless be simple in construction and durable under exposure and rough or careless treatment. Morgenstern's first ejector, it seems to us, did not fulfill these conditions. The inventor apparently realized this, for within seven months he presented a modification of it which was patented. If mechanical skill only was required to adapt Morgenstern's first unsuccessful invention to the successful result achieved by Berdan and Adams, we would expect that fact shown in the description of the second device. But it is not so; he entirely changes his spring arrangement, still leaving it with a tendency to buckle; but fails to produce a design having the distinguishing elements of the Springfield device. Simplicity, certainty, and durability.

One of the subjects named in the memorandum accompanying the order remanding this cause was thus stated:

"Whether the Government is liable upon the theory of an implied contract to compensate the plaintiffs for the ejector device in use upon the Springfield gun."

The obligation of the Government to compensate an inventor for the use of a patented invention was very fully examined in the case of McKeever (14 C. Cls. R., p. 396), where for the first time a patentee recovered royalty upon the theory of an implied contract against the United States, directly, without resort to the theretofore customary course of an action in infringement against the individual officer who had used the invention in the discharge of his official duties.

Burn's Case (12 Wall., p. 246) sustained an express contract to pay royalty and was held in the later case of *Cammeyer* vs. *Newton* (94 U. S. R., p. 225), as deciding "that the Government can not, after the patent is issued, make use of the improvement any more than a private individual without license of the inventor or making him compensation."

It is now settled that the United States is liable, as is a citizen, to pay for the use of a patented invention. Such being the inventor's right we meet a difficulty as to his remedy. If there be an express contract between the patentee and a properly authorized agent of the Government his remedy is clearly in this court; this would be so if the facts disclose an implied contract; but if the use be in its nature an infringement we are without jurisdiction in the matter.

72 In Forehands' Case (23 C. Cls. R., p. 477), there appeared at the most (admitting for argument's sake all of plaintiffs' contentions), a naked user by the Government in ignorance of any claim of right by the patentee.

The court said:

"Neither plaintiffs nor Howe submitted the patent to the Government, or asked the Government to use the invention or to pay for it, and the Government by no affirmative act recognized any right in the plaintiffs or in Howe in the alleged improvement in cartridges. To establish a contract here, therefore, we must proceed to this extent, that a contract for the use of an invention upon which the inventor may rely for the recovery of royalties is to be implied whenever the Government uses an invention, whether through ignorance or carelessness or mistake. That is, such a contract arises from naked use, even, perhaps, if under a claim of right. A mistaken or unauthorized use of an invention by a Government officer can not, however, create a contract.

"And we hold that the facts in that case developed at the most a 'disturbance or infringement' of plaintiff's rights 'not a caption of his property.'"

In the case of Schillinger (24 C. Cls. R., p. 278) we held that there had been an actual denial of plaintiff's rights in the invention used, and, after citing the cases heretofore decided in the Supreme Court and in this court, which seemed to bear on the question at issue, we said:

"A careful examination of these cases shows that a contract to convey is implied whenever the Government, acting through a competent agent, takes or uses individual property, acknowledging explicitly or tacitly that the property is individual property. No formal proceedings in condemnation

are necessary to this result. Where, however, there is a denial of private right in an alleged patent, and the invention is nevertheless appropriated or used by the Government, the appropriation is in the nature of a tort, and an action thereon is not within the general jurisdiction of this court. So if it had not been disputed that the Schillinger patent was valid and the invention had been used by the Government, acting through a competent agent, a contract for royalty would be implied."

The latest case upon this point decided by the Supreme Court is that of Palmer vs. The United States (128 U. S., p. 262). It appeared that Palmer had exhibited his invention to a board of army officers, which recommended its adoption to the War Department. This recommendation was approved by the General of the Army, and the Secretary of War adopted the device as a part of the equipment of infantry. The Government thereupon manufactured and used the patented invention. Action being brought here to recover royalty upon the theory of an implied contract, plaintiff was successful, and the judgment was affirmed by the Supreme Court upon appeal. The court held that the user was not in tort, and in delivering the opinion Mr. Justice Bradley said:

"The Government used the claimant's improvements with his consent, and certainly with the expectation on his part of receiving a reasonable compensation for the license. This is not a claim for an infringement, but a claim of compensation for an authorized use—two things totally distinct in the law, as distinct as trespass on lands is from use and occupation under a lease. The first sentence in the original opinion of the court below strikes the keynote of the argument on this point. It is as follows: 'The claimant in this case invited the Government to adopt his patented infantry equipments, and the Government did so. It is conceded on both sides that there was no infringement of the claimant's patent, and that whatever the Government did was done with the consent of the patentee and under his implied license.' We think that an implied contract for compensation fairly arose under the license to use, and the actual use, little or much, that ensued thereon. The objection, therefore, that this is an action for a tort falls to the ground."

We now turn to the findings of fact in the case at bar to discover whether under the principles thus set forth, plaintiffs have established relations in contract with defendants. It appears, generally, that the War Department is early and regularly informed of all improvements and inventions in firearms; the Department's attitude towards inventors in
73 ordnance has been one of neutrality; it has neither denied nor admitted the legal rights, if any there were, of inventors; in an endeavor to perfect the Government arms that Department has taken advantage of all knowledge within its reach and of all inventions; it does not deny the claims of inventors, but has proceeded upon the policy that executive officers should not decide upon such demands upon the Government or upon conflicting claims, but that the claims should be presented without prejudice before some other tribunal than an executive department. This being the general policy of the Department, we find as to the case at bar that the following course has been pursued as to the extractor-ejector device.

Plaintiffs were in constant communication with the ordnance officers through their agent, the inventor of the patented devices. These officers were early acquainted with the Berdan inventions, whose use the patentee

urged upon them. In 1867 Berdan showed the extractor-ejector device (patent No. 88436) to the commandant of the Springfield Armory; in August, 1868, he explained the device to the Chief of Ordnance, who said that if defendants should use any of the features of the Berdan device "they expected to pay for them when the claimant had gone through the proper channels and settled the claim."

Plaintiffs had urged the adoption of their devices by the Government and had demanded compensation therefor. It was evidently with an intention to obtain such compensation that Berdan conversed with the Chief of Ordnance, and it is undoubtedly as a sequence to that conversation that the Secretary of War wrote the Secretary of the Interior upon August 12, 1868, transmitting a communication "from H. Berdan, asking that his application for patents for various improvements in firearms be acted upon immediately by the Patent Office, in order that he may present his claims against this Department for its use of said inventions," and stating "that, so far as this Department is concerned, the early consideration of the aforesaid claims is regarded as being desirable." The application for patent, No. 88436, covering the extractor-ejector device was then pending in the Patent Office; experiments were then taking place at Springfield to perfect an extractor-ejector and in the following November the device now used in the Government musket was adopted by an order from the Acting Chief of Ordnance.

In 1873 the device for extracting and ejecting the shell was shown to a board of officers detailed to test guns and was fully described in their official report.

The statute of limitations began to run against plaintiffs' cause of action July 26, 1881, if we are correct in our conclusion upon this subject. (See previous opinion.) Prior to this, and in 1874, General Benét became Chief of Ordnance; he was familiar with the Berdan device, which he considered "as seemingly identical, certainly the mechanical equivalent" of the Springfield device for extracting and ejecting the shell, and he has continued the manufacture of the extractor-ejector upon this understanding, and upon the understanding that the Government would pay for the use of the invention through the instrumentality of the courts.

We find, then, in these facts a tender of the device to the Government and a use of the device knowingly (certainly since 1874), in the belief that the Government would be called upon to pay royalty for the device, provided the understanding of the Chief of Ordnance was correct—that
74 is, provided the Government was doing what he believed they were doing—manufacturing and using plaintiffs' device or its mechanical equivalent.

The use by the Government was not a mistaken use, for the Chief of Ordnance understood he was doing what we have decided he was doing, to wit, using plaintiffs' device. It was not an unauthorized use, for the Chief of Ordnance has a very broad power in matters of this description (R. S., sec. 1164); it was not a use in ignorance, for the Chief of Ordnance was fully informed of all the facts; it was not an antagonistic use, for plaintiffs were anxious that defendants should adopt and use their devices.

The only element of doubt seems to have been whether the ordnance officers should decide finally what they believed to be true, that plaintiffs were entitled to compensation, or whether they should leave that matter to the courts or to some other competent authority.

We are of opinion that, under the rulings of the Supreme Court and of this court, heretofore cited, the facts disclose a contract between the parties to this action for the use of the extractor-ejector device.

Having decided that the patented device has been used by the Government under an implied contract we must endeavor to find the fair and reasonable value of a license to manufacture and use the protected invention, "being such a royalty as it may reasonably be presumed the defendants would have been willing to pay and the claimant to accept, if the matter at the outset had gone to an express agreement." (McKeever vs. The United States, 14 C. Cls. R., p. 425.) We meet immediately the difficulty presented in most patent cases against defendants, namely, that the Government is necessarily the only user of the device and that there are no sales or license to others from which a market value can be found. In this case the elements from which we are to determine what is a reasonable royalty are meager.

Experts have been examined, and have given their opinions as to what would be a just compensation to plaintiffs. These witnesses are officers of the Army of great experience in the use of military firearms, and they know the cost of manufacture; but it does not appear upon what facts they base their opinions, or that they are familiar with the royalties paid upon other similar devices by this or other Governments or by private individuals. Such value as evidence of this character has consists only in the fact that it may tend to show what these officers, acting for the United States, would be willing to pay for a device of this nature were it now first presented, and were they free to contract for defendants; at the same time, it must be remembered that this testimony is given after the event and without the pressure of present official responsibility.

There also appear two licenses to use other inventions of a similar character (those of Ball and Miller), but in one case the royalty was paid as a compromise to avoid litigation, and in the other case but one element of an ejector was in question. There is also shown a sale of muskets, containing the Berdan device, to Spain, but this contract is involved with the sale of cartridges and a cartridge machine, and the royalty seems to have been paid, not for the extractor-ejector alone, but for the gun, which contained other devices.

We have also plaintiffs' bids to the Hancock board, but these bids were made in 1866, when the art was in its infancy and were for a complete musket in which a most valuable element was the breech
75 mechanism and in which the extractor-ejector device (not that in question here) was not a success and was speedily abandoned by the inventor; nor can much importance be attached to the long list of bids made in 1866 by many inventors; some of these bids we know covered a complete structure, others, we have reason to believe, covered but portions of the structure, perhaps single elements therein; all were made while the art of constructing breech-loading arms was inchoate; many (probably) were made with the single view to adapting to modern uses the large stock of muzzle-loaders in the Government arsenals and not for the construction of new guns. For similar reasons the Morse license is entitled to little weight, being made for a complete and novel structure, being made in 1858 and covering a very small number of guns. So with the payment to the Millers, which was in settlement of a single element in the combination.

Such are the details of fact from which we must deduce the ultimate fact of the measure of compensation which these plaintiffs should receive for the use one device owned by them in defendant's Springfield rifle. No one of these details alone is entitled to great weight; taken together they may be of aid in fixing a fair royalty; they vary from 10 cents to over $2 per gun. We must first place ourselves in the position occupied by the contracting parties in 1869, when the patent was issued. Since Morse's time the art had advanced; no longer do we see but one inventor with a completed structure practically the only efficient arm of the type in existence, but we find a field crowded with devices combining innumerable mechanical combinations, presented in some two thousand patents, and we know not how many other failures which have been forgotten.

At that time (1868–1869) every single element of an extractor-ejector combination was old in mechanics; the result aimed at was recognized by all; several had nearly achieved that result, so that there was left only a most narrow margin of improvement; how narrow that margin was we have seen; how naturally it would be crossed under the strain of competition is shown by the fact that two men, working independently, achieved an equal measure of success. In 1869 the defendants had open to their choice very many devices, and there remained the probability of still further improvements, for the art was in a feverish state and invention was rapidly succeeding invention. There was then no element of certainty; now, after twenty years, we may conclude that the device adopted was the best possible, but then no one could know what the next day would bring forth; nor was it then possible to foresee the great success which has since been achieved.

We know now that the Springfield extractor-ejector device is valuable; that it is durable and useful; that it is believed to be the best known in the art for use in a single-fire musket of the Springfield type, but none of this was known in 1869. Then all was in doubt; neither side knew that with the Berdan-Adams device final success in extractor-ejector devices had been attained; nor did either side know what was the extent of danger from attack by other patentees whose devices very closely resembled that adopted. The quieting licenses we have cited are examples of the troubled state of the art at that time.

Lastly, the quality of the licensee and the quantity of the arms are to be considered. We are not discussing an exclusive license which
76 should limit plaintiffs to the United States as their only customer; admitting that they were to remain free to press their invention abroad, the adoption of it by their own Government had a certain value in itself. Of more importance is the large number of arms to be manufactured, for he who deals by wholesale charges a less percentage of profit than he who deals by retail, especially when he is put to no cost of manufacture.

From all this we deduce these elements of importance to a contract made in 1869: value in the invention, uncertainty in the art, danger of litigation, a valuable customer, a large contract, comparative cheapness of production, and lack of novelty in any element of the combination; nor must we forget the Miller plate for which the Government has paid.

It appears that Berdan offered a complete gun in 1866 to the Government for $1.25 each for over 200,000 guns. The extractor device

in that gun was not a success for a center-fire cartridge, but the breech mechanism was approved as the best plan known. There were paid to inventors of ejectors, for the purpose of quieting possible proceedings in infringement, some 10 cents per gun; there was paid to Miller by plaintiffs for his extractor plates used in a small number of muskets a trifle less than an average of 10 cents for each plate, and he was settled with by defendants for $20,000; the Spanish Government paid about $2.50 for an entire gun purchased in small numbers and under some complications; military experts place the fair royalty for the device at $2.66⅔ per gun; the saving in manufacture is $1.25 per gun, the cost of making the gun ran (during the years in question) from $12.72 to $11.88. From these elements (all set forth in the findings), and following the reasoning in McKeever's case (supra), we conclude that a fair and reasonable royalty for the right to manufacture and use the extractor-ejector device was 5 per cent of the minimum cost of manufacturing the gun during the period in question. Judgment for plaintiffs in the sum of $95,004.36.

77 XI.—*Judgment of the court.*

At a Court of Claims, held in the city of Washington, on the 8th day of December, A. D. 1890, judgment was ordered to be entered as follows:

The court, on due consideration of the premises, find for the claimant, and do order, adjudge, and decree that the said The Berdan Firearms Manufacturing Company do have and recover of and from the United States the sum of ninety-five thousand and four dollars and thirty-six cents ($95,004.36).

BY THE COURT.

78 XII.—*Application of defendants for and allowance of appeal.*

From the judgment rendered in the above-entitled cause on the 8th day of December, 1890, in favor of claimant, the defendants, by the Attorney-General, on the 18th day of February, 1891, make application for and give notice of an appeal to the Supreme Court of the United States.

JOHN B. COTTON,
Asst. Attorney-General.

Filed and allowed in open court February 18, 1891.

WILLIAM A. RICHARDSON,
Chief Justice.

79 XIII.—*Application of claimant for and allowance of appeal.*

Now, comes the complainant, by attorney, and moves the court to allow an appeal from the decision and judgment of said Court of Claims rendered December 8th, 1890, in the above-named cause, to the Supreme Court of the United States.

GEO. S. BOUTWELL,
Att'y for Claimant.

Filed February 25, 1891, and allowed in open court.

WILLIAM A. RICHARDSON,
Chief Justice.

80 IN THE COURT OF CLAIMS.

XIV.

THE BERDAN FIREARMS MANUFACTURING Company
vs.
THE UNITED STATES. } No. 15726.

I, John Randolph, assistant clerk of the Court of Claims, do hereby certify that the foregoing are true transcripts of the pleadings in the above-entitled cause, of the findings of fact by the court and the conclusion of law thereon, of the opinions of the court, of the judgment of the court, of the application of the defendant and of the claimant for allowance of appeal to the Supreme Court of the United States, and the allowance of said appeals.

In testimony whereof I have hereunto set my hand and affixed the seal of said court, at Washington, this fifth day of March, A. D. 1891.

[SEAL.] JOHN RANDOLPH,
Asst. Clerk Court of Claims.

(Indorsement on cover:) Court of Claims, No. 438. The United States, appellant, vs. The Berdan Firearms Manufacturing Company. 14579. Filed April 17, 1891, and No. 445. The Berdan Firearms Manufacturing Company, appellant, vs. The United States. 14588. Filed April 21, 1891.

FILED.
DEC 14 1894
JAMES H. McKENNEY,
CLERK.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1894.

THE UNITED STATES, APPELLANT, *v.* THE BERDAN FIREARMS MANUFACTURING COMPANY.	*No.* 128.
THE BERDAN FIREARMS MANUFACTURING COMPANY, APPELLANT, *v.* THE UNITED STATES.	*No.* 135.

Appeals from the Court of Claims.

Brief for the Claimant.

GEO. S. BOUTWELL,
JOSEPH H. CHOATE,
for the Claimant.

WASHINGTON, D. C.:
GIBSON BROS., PRINTERS AND BOOKBINDERS.
1894.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1894.

THE UNITED STATES, APPELLANT, *v.* THE BERDAN FIREARMS MANUFACTURING COMPANY.	*No.* 128.
THE BERDAN FIREARMS MANUFACTURING COMPANY, APPELLANT, *v.* THE UNITED STATES.	*No.* 135.

Appeals from the Court of Claims.

Brief for the Claimant.

NATURE OF THE CASE.

The petition in the Court of Claims, filed July 26, 1887, represented that Hiram Berdan, a citizen of the United

States, was the first and the original inventor or discoverer of certain new and useful inventions, viz., new and useful improvements in breech-loading guns;

That patents therefor, granted by the United States, had been issued to the said Berdan;

That the patents so issued had been assigned to the claimant;

That the said inventions had been used by the Government of the United States, through its duly accredited and authorized officers, and with the consent of the claimant;

That the understanding on the part of both parties was that compensation therefor should be paid; and

That no compensation had been made to the claimant.

Nature of the Claims.

The case, as it was presented in the Court of Claims, sets forth two distinct claims founded, as was alleged, upon two patents issued to Hiram Berdan as the inventor. The first patent on which reliance was placed was granted February 27, 1866, being No. 52,925, and entitled "Improvement in breech-loading firearms." The second patent was dated March 30, 1869, being No. 88,436, and also entitled "Improvement in breech-loading firearms."

These two patents were duly assigned to the Berdan Firearms Manufacturing Co., the plaintiff in this case before the Court of Claims (Finding III and Finding X).

The claim under patent No. 88,436, being for a spring so applied in combination with the ejector plate of a breech-loading firearm as to eject from the barrel of the gun the shell of the cartridge after the discharge, was sustained by the Court of Claims, and judgment was rendered in the gross sum of $95,004.36. The claim under patent

No. 52,925 was for the construction and arrangement of the breech block by which the recoil at the discharge of the musket was received upon the shoulder, at the rear of the breech block, on the line of the axis of the bore of the barrel of the gun, and also for the invention of the safety notch in the tumbler of the lock. These claims were disallowed upon the interpretation given to the claims of the patent, and for the reasons set forth in the first opinion of the court (Record, p. 9).

History of the Case.

In an order of the Secretary of War, dated January 30, 1866, a board of officers of the army, of which Maj. Gen. W. S. Hancock was named as president, was convened at Washington, under instructions to make investigations with reference to changes and improvements in breech-loading arms. Specific instructions were given, as set forth in the first finding of the Court of Claims (R., p. 29). On the 10th of March of the same year the commission issued a blank form of proposal for the presentation of arms to the board for trial under the orders which had been prescribed by the Secretary of War (R., p. 30). The Berdan Firearms Co., by its president, submitted to the said board a communication in which the company alleged its proprietorship of a patent relating to breech-loading firearms, and submitted specimens of guns containing the devices covered by said patent, and proposing also to allow the Government to manufacture quantities of guns containing said devices upon an agreement to pay certain specified sums for the privilege of manufacturing guns containing the devices. The prices so named by the company were graduated upon the number of guns that might be manufactured, with a decreasing rate per gun as

the number of guns manufactured should be increased (Finding IV, R., p. 30). The proposition so submitted was signed "C. L. Perkins, president Berdan Firearms Co."

The proposition of the company was neither accepted nor rejected, but on the 4th day of June, 1866, the board of officers made a final report to the Secretary of War, which contained these recommendations and statements, viz: "This board recommends the plan of alteration submitted by Hiram Berdan. This gives the stable breech pin, secures the piece against premature discharge, and involves only a slight change of our present pattern of arms" (Finding VIII, p. 33).

On the 21st day of May, 1866, Hiram Berdan, styling himself vice-president of the Berdan Firearms Co., presented a letter to the Hancock board, in which, among other things, he said: "I have the honor to submit, for the consideration of the board, gun No. 4 as a plan for altering a musket into a breech-loader; also a plan for making new muskets and carbines." He then proceeds to set forth the particulars in which gun No. 4 differed from guns No. 1 and No. 2, which he says had been previously submitted. At the end of his letter he says: "We make no extra charge for these improvements" (Finding VII, p. 32).

On the 16th day of June, 1866, the Chief of Ordnance made a report upon the subject to the Secretary of War, in which he alluded to the Berdan gun and four others, and recommended that fifty of each be prepared at the Springfield Armory and that the same be issued to troops. These recommendations were approved by the Lieutenant General, who, at the same time, disapproved of the proposition contained in the report of the Chief of Ordnance by which new patent arms were to be placed in the hands of troops for trial. The Secretary of War, under date

of July 26, 1866, ordered "the conversion of 25,000 Springfield muskets into breech-loaders of the best pattern" (Finding IX, p. 33). These guns are represented by Exhibit "Springfield Gun, 1868."

In the month of July, 1868, Berdan filed two applications in the Patent Office for improvements in breech-loading arms, for which patents were issued subsequently, one of them being the patent already referred to, dated March 30, 1869, and numbered 88,436 (Finding X, p. 33).

Under date of August 3, 1868, Berdan wrote a letter to Gen. A. B. Dyer, then Chief of Ordnance, in which he informed him that he had applications for patents relating to breech-loading muskets then pending in the Patent Office, and that he was informed that the business of the Patent Office was then five months behindhand, but that his "application would be acted upon at once on the receipt of a note from the Department that it is desirable that this application should be disposed of to enable me to present my claim to the Government for the use of said patent." Following that letter and on the 12th day of August, 1868, Gen. Schofield, then Secretary of War, addressed a letter to the Secretary of the Interior, in which he called attention to Gen. Berdan's application "for patents for various improvements in firearms," and then said: "As far as this Department is concerned, the early consideration of the aforesaid claims is regarded as desirable" (Finding XXIII, pp. 42–43).

In the autumn of the year 1867, Berdan showed to Col. Benton, Commandant of the Springfield Armory, and at the Armory, a transformed musket containing the extractor-ejector subsequently described in the specification and claims of patent No. 88,436. Col. Benton then and there examined and tested the device. At that interview the Chief of Ordnance stated in substance: "That *if any of*

the features should be used by defendant in the Springfield gun, the ordnance officers expected to pay for them when the claimant had gone through the proper channels and settled the claim" (Finding XXIII, p. 42).

The manufacture of guns containing the extractor device referred to commenced in the month of June, 1869. Between that date and the 30th day of March, 1886, the Government officers at Springfield made 384,892 muskets containing the device covered by patent No. 88,436.

The petition of the Berdan Firearms Co. was filed the 26th day of July, 1887, and the Court of Claims sustained the plea of the statute of limitations interposed by the defendant, and allowed the claimant compensation for the number of muskets manufactured between the 26th day of July, 1881, and the date of the expiration of the patent. The court found that 224,952 muskets were made previous to July 26, 1881, and that 159,940 muskets were made between that date and the date of the expiration of the patent (Finding XXIV, p. 46).

In the year 1873 a board of officers, known as "The Terry Board," was detailed to test guns. In the year 1874 Gen. Benét became Chief of Ordnance, and the Court of Claims found as a fact that the device described in patent No. 88,436 was exhibited and fully described to the Terry Board. They further found that Gen. Benét, when he became Chief of Ordnance, had knowledge of the doings of the Terry Board in regard to the device in question, and that he then understood that that device for extracting and ejecting the shell as described in the Terry report was "Seemingly identical, certainly the mechanical equivalent of Berdan's device for the same purpose, covered by patent No. 88,436." They also found that Gen. Benét, after the decision in the McKeever case, made at the December term of the Court of Claims of the year 1878, was

of opinion that "Inventions secured by letters patent are property in the holder of the patent" and could "not be taken by the United States without due compensation, and that the use of an invention protected by a patent is the use of private property that must be paid for and is, therefore, an implied contract that has a place in court, and that if the validity of the patent is sustained and its use by the Government is proven to the satisfaction of the court, the inventor must be paid."

The court found, further, that "Gen. Benét, with this understanding, continued the manufacture of the Springfield gun containing the disputed ejector and extractor device, after the adjournment of the Terry Board, with the expectation that if the court sustained the claim by Berdan against the Government on his patent No. 88,436, then the Government must pay him for the use of his invention."

The court further found that the "plaintiffs have desired that the Government should use their patented devices, and requested compensation for such use." The court also found as follows: "Upon the foregoing facts, the court finds that since 1874 the Berdan extractor-ejector device (described in patent No. 88,436) has been used by defendant's ordnance officers, knowingly and without claim of adverse right, believing the device in the Springfield gun to be the device or the mechanical equivalent of the device covered by said letters patent, and with the anticipation that should the understanding of the said ordnance officers as to plaintiff's rights be judicially decided to be correct, the defendant would compensate plaintiff for such use" (Finding XXIII, pp. 42 to 46).

The Court of Claims also found that the War Department was "early and regularly informed of all improvements and inventions in firearms and ammunition;" that it was "aware of the state of the art at all times,"

and that it generally had knowledge "of all patents upon firearms as soon as issued," and, again, that "the attitude of the War Department towards inventors has been one of neutrality; it neither denied nor admitted the legal rights, if any there were, of inventors;" and that "in an endeavor to perfect the Government arm, that Department has taken advantage of all knowledge within its reach, and of all inventions."

The court found, further, that the War Department "does not deny the claims of inventors, but has proceeded upon the policy that executive officers should not decide upon such claims against the Government, or upon conflicting claims, but that the claim should be presented, without prejudice, before some other tribunal than an Executive Department."

The court also found that Berdan, as an officer of the plaintiffs, was "in constant communication with the ordnance officers, requesting the use of his devices by the Government;" that "they knew him as an inventor, and knew his inventions as soon as they were patented" (Finding XIX, p. 38).

The court also found that one Adams, an employee of the Government, invented an ejector which, in all respects, corresponded with the invention of Berdan, with the exception that the power for the ejection of the shell in the Adams ejector was communicated by a spiral spring, while in the Berdan ejector it was communicated by a flat or U spring.

The court also found that Berdan's application for his patent anticipated the invention by Adams, and that the flat spring or U spring and the spiral spring were mechanical equivalents; and that, the flat spring applied to an ejector being already known, the introduction of a spiral spring was only a mechanical change not involving the exercise of inventive faculty (Finding XVII, p. 37).

The history of the case, as set forth in the findings of the Court of Claims, will be relied upon, at the hearing, in support of two positions of the Berdan Firearms Manufacturing Company, viz: The claim that the Court of Claims erred in sustaining the plea of the statute of limitations interposed by the Government; and, secondly, the history of the case will be relied upon in support of the position of the claimant that the facts set forth justify the conclusion of law that there was an implied contract on the part of the Government to make compensation for the use of each and every invention made by Berdan and that might be introduced into firearms manufactured under the authority of the Government.

As the Government and the Firearms Company are alike appellants in the case, the parties will be designated in this brief, as they were designated in the Court of Claims, as "claimant" and "defendant."

Errors.

The counsel for the claimant contend that the Court of Claims erred in the following particulars, viz:

(1) In finding that the Springfield musket did not contain the invention described and claimed in patent No. 52,925, as the said invention is described and claimed in that patent.

(2) That the court erred in finding that the defendant was not liable for the use of a jointed, swinging breech piece when so arranged in a breech-loading musket as that the brace of such breech piece would have a bearing upon the shoulder at the rear end of the chamber which receives the jointed, swinging breech piece, in such manner as that the recoil, when the musket is discharged, shall be upon a point of the shoulder in the plane of the

axis of the bore of the gun as the same is described in the patent No. 52,925, unless its use by the defendant was in combination with the elements described in said patent and in some one of the claims of said patent.

(3) That the court erred in the formulation of the rule by which compensation was allowed for the use of the ejector devices described and claimed in patent No. 88,436.

(4) That the court erred in sustaining the plea of the statute of limitations interposed by the defendant, by which compensation for the use of the ejector devices in 224,952 muskets manufactured previous to July 26, 1881, was rejected.

It seems to be within the scope of a proper examination of the questions arising under these several averments of error, for counsel to refer to the opinions of the Court of Claims for the purpose of ascertaining the processes by which the conclusions set forth in the findings have been reached. From such examination it appears that the court accepted a gun, marked Exhibit 1, as a perfect illustration of the devices described and claimed in patent No. 52,925. The point is made that the questions arising upon the patent, as to the use of the inventions described in the patent, should have been determined solely by an examination of the Springfield musket, which, as is alleged, contains the Berdan inventions, and by a comparison of the devices in that musket with the devices described and claimed in the patent. The court seems not to have had in mind the nature of the inventions made by Berdan, and to have given more consideration than was proper to the musket in which the inventions were exhibited. The swinging breech block was not new, nor was the joint swinging breech block new, nor was a breech-loading musket new at the time when the alleged inventions of Berdan were made.

His chief invention consisted in the construction of the jointed, swinging breech piece, so arranged as that when the breech piece was laid in its chamber the recoil upon the discharge of the musket was in the line of the axis of the bore of the gun. This was obtained by the use of a second hinge, the bearing of which, when the breech was closed, was in the same plane with the axis of the bore of the gun. It is apparent that if a longitudinal section be cut from the barrel of a gun by vertical incisions at each end, and the piece so cut out be hinged to the barrel at one end, the piece so cut out cannot again be inserted in the barrel. It is also equally apparent that if the hinge be fixed while the piece so cut out is in its original place in the barrel, it cannot be removed. Such being the mechanical facts, all the breech blocks made previous to the Berdan invention were bevelled at the rear, so that the block could be removed for the purpose of inserting the cartridge. This is illustrated by reference to the Allin gun, which, in the year 1866, when Berdan made his inventions, was the ultimate and best exhibition of the art then known to the War Department.

The practical problem then to be solved was the construction of a breech-block arrangement in such manner as that the recoil upon the shoulder should be in the line of the axis of the bore of the gun. This problem was solved practically by Berdan.

The Hancock board, in recommending the plan of alteration submitted by Berdan in 1866, said of it: "This gives a stable breech pin, secures the piece against premature discharge, and involves only a slight change of our present pattern of arms" (Finding VIII, p. 33). This condition of the mechanism is described in the specifications of the Berdan patent (p. 2).

Speaking of the breech piece C and brace D, which to-

breech block into two parts and so arranging the two parts by a hinged connection as that the pivot or arbor of the lower hinge should be on the line of the axis of the bore of the barrel. That arrangement of necessity forced the recoil, when the musket was discharged, upon the line of the axis of the barrel and upon the line of the lower hinged connection, and thus transmitted the force of the recoil upon the same line to the shoulder on which the brace of the breech-block piece was made to rest. It is manifest that the essence of this invention did not consist in the division of the breech piece at any particular point. It might have been near the forward end or near the rear end, and there is nothing in the specifications of the patent or in the claims which indicates that Berdan placed any reliance upon the division of the solid breech piece at any particular point. Practically, in the guns that he has exhibited, his division was near the centre.

It appears from the findings (Finding I, p. 29) that in the year 1866 the Government had on hand a large number of muzzle-loading muskets which the authorities wished to change to breech-loading muskets. It also appears that at that time the Government was using the Allin device, sometimes called the model of 1865, upon which were issued letters patent No. 49,959 (Finding II, p. 30). The Allin device contained the cam for locking the breech block under the shoulder, as has been mentioned. That cam was made to swing on a second pivot as distinguished from the hinge on which the swinging breech block was hung, and thus it was, in fact, a jointed, swinging breech piece. It differed, however, from the Berdan jointed, swinging breech piece in two particulars, viz: that the pivot of the second hinge was not systematically and by plan in the plane of the axis of the bore of the gun; secondly, that there was no provision whatever by

which the recoil of the gun could be transferred from the breech block to any point on the shoulder, and certainly not to a point on the line of the axis of the bore of the barrel, which is, in fact, the essential quality in the invention, by which danger from the uplifting of the breech block is wholly averted. Berdan's invention was a generic invention inasmuch as he was the original and first inventor of an arrangement of the breech block of a breech-loading musket by which the recoil of the gun at the moment of the discharge was received upon the breech pin or the shoulder at a point on the line of the axis of the bore of the barrel.

In such a case the doctrine of equivalents is to receive a liberal construction. (Beach *v.* American Box Machine Co., O. G. V. 69, p. 1067).

When the Berdan gun, whatever may have been its organization as to combination with other elements, was submitted to the Hancock board in 1866, that board saw at once that the cam in the Allin gun could be converted into the brace as it was represented in the Berdan gun, and that the safety notch could be introduced, and thus they were able to say in their report to the Secretary of War: "This board recommends the plan of alteration submitted by H. Berdan. This gives a stable breech pin, secures the piece against premature discharge, and *involves only a slight change of our present pattern of arms.*" Thus does it appear that the board contemplated the use of the two features of the Berdan invention.

The change referred to must have been the alteration of the Allin cam into a brace which would perform the same office as the brace in the Berdan gun, together with the introduction of the third notch in the tumbler of the lock by which security was furnished against the acci-

dental opening of the breech block, and also against the premature discharge of the gun.

The court found that "In Allin's gun the cam latch was simply a locking device, while in the Springfield gun it also takes up and transmits the recoil as did the brace of Berdan's gun of 1866" (Finding XI, p. 34).

The evidence of the change made by which the Allin cam was converted into the Berdan brace can be seen from an inspection of the guns as to one of the features. The arm of the cam, which constituted a latch or a lock in the Allin gun, was enlarged and changed in form and a new face was given to it by which a horizontal bearing upon the shoulder or breech pin of the gun was effected and on the line of the axis of the bore of the gun. This fact was found by the Court of Claims, and the evidence of it is apparent upon a comparison of the Allin gun of 1866 and the Springfield musket of 1884 and of other years subsequent to 1868. The change in the position of the bearing rivet, by which the cam is connected with the breech block, is not so apparent. It is, however, wholly immaterial whether, by accident or by convenience, the arbor by which the cam in the Allin gun was connected with the breech block was in the plane of the axis of the bore of the gun or not. It was not part of his system that it should be in that plane, and if it were a part of his system, it could have no bearing on the question now at issue, inasmuch as there is no arrangement by which the force of the recoil could be transmitted to the shoulder of the breech block on a line with the axis of the bore. That change was made after the presentation of the Berdan gun to the Hancock board, and it transformed the Allin cam latch into a breech-block brace upon a line with the axis of the bore of the barrel, and thus a result was produced corresponding to the claims in the Berdan

patent, and by substantially the same organization of elements.

The court erred in assuming, as it did assume (Finding II, p. 34), that Berdan made no provision by which the pins or arbors of the hinges of the breech block were protected from injury by the recoil upon the discharge of the musket. He described in the fourth claim an elongated hole or holes in the strap E, which was attached to the barrel of the gun in front of the breech block. These elongated holes furnished an opportunity for the recoil of the breech block without a strain upon the rivets. He said also in his description (p. 2, patent) "that these elongated holes were for the purpose of allowing the hinge to move longitudinally as far as desirable." In addition thereto, he said: "The same result may be obtained by elongating the hole or holes in the hinge *c'*, which receives its joint pin." The joint pin there spoken of is the pin of the hinge which connects the breech piece C to the brace D as they are specified in the patent.

In the Springfield gun, provision is made for the recoil by the elongation of the holes where what was called the cam is connected with the main body of the breech block.

The court erred in saying, as is said (Finding XII, p. 35), "The Berdan gun, patent No. 52,925, was not loose-jointed. When the breech block was down, there was no play, for then the block abutted against the barrel at one end, and the brace against the breech screw at the other."

This may have been so in the Berdan gun exhibited, and if such were the fact no inference adverse to this claim can be drawn therefrom inasmuch as, by the description in the patent, allowance was made for the longitudinal movement of the breech block; but if there had been no allowance for the recoil, the invention by

Berdan would have been as perfect and as defensible as it is, now that provision has been made for the longitudinal movement of the breech block. The elongation of the holes for the bearing of the rivets is no part of the invention, and the absence of such provision would work no injury to the claim.

It is true, as is said by the court, that "in the Springfield gun the cam latch performs an additional and different office from Allin's cam latch."

The court then proceeds to describe the process by which provision is made in the Springfield gun, which did not exist in the Allin gun, for the recoil, without danger to the pins or shafts at the joints, but it is also true that Berdan made provision for loose joints at one or both of the hinge connections, and thus it appears that in that particular the Springfield gun conformed to the claim and description of the Berdan patent, and in that respect it was a departure from the Allin gun.

The court seems to have rested in the opinion that Allin's cam latch, after it was so changed that it took up and transmitted "the recoil as did the brace in Berdan's gun of 1866," also continued to perform the function of a cam latch. It is true that the organization of the cam latch in many particulars reappears in the Springfield gun, but its office as a lock or cam latch has disappeared altogether, and for the reason that, the recoil of the gun being transmitted on a line with the bore to the shoulder, there could be no pressure upon the breech block tending to lift it out of the receiver. Indeed, the hood of metal over the recess in which the arm of the cam latch, when it was transformed into a brace, was laid, might have been removed without peril in the use of the gun.

The Springfield rifle of 1866 contains the brace, but of imperfect construction. The second notch is changed in

position as compared with the Allin gun, but not so changed as to prevent the unlocking of the breech block.

The construction of the brace is improved in the gun of 1868, but the arrangement of the notch is the same as in the gun of 1866.

The musket of 1873, and all the guns made after 1873, contain the Berdan brace, the third notch, and the spring. This rifle became the weapon of the army upon the recommendation of the "Terry Board," and in conformity to the legislation of Congress in the terms following:

"For manufacture of arms at the national armory, $150,000, provided that no part of this appropriation shall be expended until a breech-loading system for muskets and carbines shall have been adopted for the military service upon the recommendation of the board to be appointed by the Secretary of War. * * *

"And no royalty shall be paid by the Government of the United States for the use of said patent to any one of its officers or employees, or for *any patent* in which said officers or employees may be directly or indirectly interested.

"Stat. L., v. 17, c. 316, sec. 1, p. 261, June 6, 1872.

"For manufacture at national armories, of the new model breech-loading musket and carbine, adopted for the military service on recommendation of board of officers convened under act of June 6, 1872, $100,000."

Stat. L. v. 19, c. 226, sec. 1, p. 100, July 24, 1876.

This legislation justifies the inference that Congress had knowledge of the existence of patents that were to be used in the new muskets, and that they were to be paid for, except as to inventions made by employees.

The phrase *said patent* referred to a patent by one *More*, who is named in the text of the statute, and who, probably, was an employee of the Government.

The fourth claim in the Berdan patent is in these words: "The elongated hole or holes in the strap E or other part of the hinged connection of the swinging breech piece C in combination with the circular projection *b*, provided on the face of the breech piece to enter the chamber of the barrel substantially as hereinbefore specified, whereby the self-adjustment of the breech piece to the recoil bearing is provided for, and the liability to strain the hinge by any rear or forward tendency of the breech piece is counteracted."

In this claim there are three parts in combination, and they are all found in the Springfield gun. First, the elongated hole or holes in the strap E, which is represented as a strap on the upper part of the barrel of the gun and in front of the breech block, and to which the breech block is connected by a hinge arrangement, the pivots or arbors for which are set in elongated holes. Bearing in mind that Berdan, in his specifications, mentions the fact that the same result would be produced by elongated holes in the hinge connection between the breech piece C and the brace D, and that in this claim he uses these words, "or other part of the hinged connection of the swinging breech piece C," there can remain no question that the use of the elongated holes in the Springfield musket is, as a mechanical arrangement, precisely that which is described and claimed in the Berdan patent.

Next, there is a circular projection specified in Berdan's claim, marked *b*, which is made to enter the chamber of the barrel, and thus prevent the upward lifting of the breech block at the forward end. In the Springfield gun the forward end of the breech block enters under a plate or body of metal attached to the barrel of the gun at the same place, substantially, as is the strap E specified in Berdan's claim, and performing precisely the same

office. Both modes of controlling the upward tendency of the breech block were perfectly well known at the time, and they are equivalent devices, used for the same purpose, and the change in the Springfield gun, from the Berdan description, would not constitute a defence in a suit for infringement. The third element in the combination is the swinging breech piece C. The cam in the Springfield gun, upon its conversion into a brace, as hereinbefore described, must be considered the equivalent of the Berdan brace.

If these propositions are sound, then the Springfield gun arrangement would be held to be an infringement of the Berdan invention, as it is described and claimed in the fourth claim of his patent. It is true that in that claim the organization of the hinged swinging breech piece C is not described except by the phrase "*substantially as herein specified*," which should be construed to carry with it the breech piece C and the brace D, organized as described in the patent and combined in the second claim.

The presentation of the case of the claimant has proceeded thus far as the case might have been presented if the suit had been for the infringement of the plaintiffs' patent.

The second point of error is to the effect that the claimant is not bound to show that the essential features of the Berdan invention have been used in the Springfield gun, in an organization corresponding technically to the organization described and claimed in the patent. It is claimed, on the contrary, that if any essential feature of the Berdan invention, which was new, has been used in the Springfield gun, then the defendant is liable for its use. In this statement it is assumed that the contract found by the Court of Claims to have existed between the

parties to the suit will be recognized by this court, and, if so, that consequently the construction for which the claimant contends must be accepted.

It appears, from Findings II and IV, p. 30, that the Berdan Firearms Co. never contemplated the manufacture and sale of guns to the United States; and it also appears, from Finding VIII, p. 33, that the Government never contemplated the purchase of arms from the Berdan Co. The Berdan Co. proposed to "grant the right to manufacture the aforesaid breech-loading arms on the following terms."

The Hancock board, in its report to the Secretary of War, said: "This board recommends the *plan of alteration* submitted by H. Berdan."

It appears from Finding IX, p. 33, that "there was a large number of muzzle-loading arms on hand, capable of economical alteration." The number of such guns is not here stated, but it is known to have been about one million in all. The objective point of the inquiry by the board was a plan of alteration which could be adapted to the muzzle-loading muskets then on hand, and that with the least possible expense to the Government.

It is of general knowledge that the parts of a gun, and especially of a lock, are made by machinery, and so accurately made that every part is interchangeable, and that each part may be introduced into any other lock than that in which it was originally placed. The machinery by which these parts are produced is expensive, and the wisdom of the recommendation of the Hancock board is manifest when, after stating the advantages of the Berdan gun, they say that the alteration "involves only a slight change in our present pattern of arms."

This report justifies, indeed renders unavoidable, the conclusion that the board had no idea of purchasing the

gun-lock or gun which Berdan exhibited for the purpose of illustrating the character and value of his inventions, nor, indeed, did the board contemplate the construction of a gun containing necessarily the combination of parts described in Berdan's patent or illustrated in the gun that he presented. The sole object of the board was to select from Berdan's system whatever could be made useful in the alteration of the muzzle-loading guns to which the attention of the board was then exclusively directed.

Nor can it be assumed that the board had any purpose to take from Berdan's system the essential parts thereof and apply them to the muzzle-loading guns belonging to the Government, and, by omitting to use the elements that were described in combination in Berdan's patent, to avoid all liability to make compensation.

And, with stronger reason, it is not to be assumed that the Lieutenant General, when he approved the recommendations of the board in respect to the Berdan gun, had any such purpose in his mind, or that any such purpose was entertained by the Secretary of War when he ordered the conversion of "25,000 Springfield muskets into *breech-loaders of the best pattern*" (p. 33).

In harmony with this view is the finding of the Court of Claims, that "The Chief of Ordnance said in substance that *if any of the features* should be used by defendant in the Springfield gun, the ordnance officers expected to pay for them when the claimant had gone through the proper channels and settled the claim" (Finding XXIII, p. 42).

It is claimed that the Government used the Berdan breech block; that it used the third notch, or safety notch, in the tumbler of the lock; that both these devices were new; that they were invented by Berdan; that they were described and claimed in his patent No. 52,925; that it was the understanding of both parties, when the negotia-

tions were taking place, that he was to be paid for whatever features there were in his system that were new and that should be introduced into the Springfield gun.

As to the third error in the findings of the court, it is averred that the court erred in the formulation of the rule by which compensation was allowed for the use of the ejector device described and claimed in patent No. 88,436.

The court found, and as a conclusion of law, that the sum of $95,004.26 was due to the claimant, and this in accordance with a rule which is set forth in Finding XXII, p. 42. The rule and the finding based thereon are open to inquiry and revision in this court.

The rule established by the court was an allowance of five per cent. on the lowest cost of manufacturing guns at a time between the years 1882 and 1885, inclusive. That cost was $11.88 for each gun (Finding XXII, p. 32).

This rule appears to have been arbitrarily adopted, and it was supported by a reference to the case of McKeever *v.* The United States, reported in the 14th vol. of the Reports of the Court of Claims.

An examination of the text of that case fails to show any analogy between that and the Berdan case. The subject of McKeever's invention was a cartridge box, and the evidence showed that he had been paid a royalty of 25 cents per box. It also appeared that portions of his system had been the subject of inventions by two other parties. Upon these facts an allowance was made to the claimant of 20 cents per box as his share of the amount which had been paid as royalty for the privilege of manufacturing cartridge boxes in which the devices of three patentees were embodied.

In the Berdan case the findings show that the devices of Berdan had not been used in this country by any other party than the United States, and consequently that there

was no basis for an allowance corresponding to the basis that existed in the McKeever case.

The Court of Claims found that the cost of manufacturing the Berdan extractor ejector was $1.25 less per gun than the cost of manufacturing the Allin extractor.

The court also found "that several witnesses of high military position, experts in the practical use of arms of this description and familiar with the cost of manufacture, had testified to the great saving in the extractor-ejector device claimed to be covered (and understood by them to be covered) by patent No. 88,436, and they are of the opinion that a reasonable royalty for the use of this device would be the saving in cost over the Allin device, plus a sum, varying somewhat with each witness, but of which the average is $1.41⅔ per musket, thus giving as royalty the sum of $2.66⅔ per musket."

They further say: "It does not appear upon what facts these witnesses based their opinions or that they were cognizant of facts in relation to sales or licenses of these or other similar inventions upon which to found their opinions."

As so much of the petition of the claimant as related to what is known as the breech block was dismissed, there were no findings as to the value of that invention. As to the compensation for the use of the ejector, whether including or excluding specific compensation for the breech block, the points that seem to be worthy of consideration are these, viz:

First. If the proposal of the Hancock board and the proposition of the Berdan Firearms Co., in connection with the report of the board recommending the Berdan gun, the approval of that report by the Lieutenant General, and the subsequent endorsement of the same by the Secretary of War, are held to constitute a contract between

the Firearms Co. and the Government, which continued in force until the expiration of the patents, then the measure of compensation for the use of the Berdan inventions would follow the proposal made by the Berdan Firearms Co.

Second. If this be not so, then it is contended that the claimant is entitled to a *quantum meruit* compensation for the use of each invention to which Berdan's claim as inventor may be established, and under the rule that the party using an invention should pay an amount equal to the benefit which he has derived from the use of that invention over and above the benefit which he could have derived from the use of any device which otherwise would have been within his reach.

In accordance with this last proposition, it may be said that the court has found, as an indisputable fact, that the Government was benefited to the extent of $1.25 in the cost of each gun by the use of the Berdan extractor ejector as compared with the cost of the Allin extractor, which was then the best device at the command of the Government. To this it would seen reasonable to add the average of the estimates made as to the superiority for use of the Berdan ejector over the Allin extractor.

The hardship of the rule adopted by the court is seen in the facts that the average cost of the guns manufactured between the years 1882–1885 was $12.28, and the highest cost was $12.72. Again, the cost of manufacturing the gun was reduced, by the Berdan invention, in the sum of $1.25 per gun, and thus it has come to pass, under the rule of the court, that the claimant, in consequence of the superiority of the invention, suffers something more than six cents royalty on each gun for which compensation has been allowed by the court for the use of the Berdan extractor ejector.

Special consideration is due to two points raised by the Assistant Attorney-General in his brief for the Government. He denies that the flat spring and the spiral spring are equivalent mechanical devices as they are used or may be used in moving the extractor ejector introduced into the Springfield gun.

The court has found that the "defendant's ordnance officers, knowingly and without claim of adverse right, believing the device in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by said letters patent (No. 88,436), and with the anticipation that should the understanding of the said ordnance officers as to the plaintiff's rights be judicially decided to be correct, the defendant would compensate plaintiff for such use" (Finding XXIII, p. 46).

In Finding XVII, p. 37, the court says: "The only difference between the Berdan and Adams devices is, that Berdan used a flat spring, while the Government used a spiral spring with a spindle or plunger, both performing the same office and attaining the same result in the same way; the use of the flat spring or of the spiral spring is matter of choice and is in no way material to the result." This finding would seem to close all controversy and end debate.

Col. Benton, when in command of the armory at Springfield, Mass., wrote to Gen. Dyer, then Chief of Ordnance, on the 25th day of August, 1868, and in that letter he informs the Chief of Ordnance that he had sent to him by express "a box containing a rifled musket altered to a breech-loader of the plan of 1868, and a wooden model of the same with a spiral spring extractor." He says further: "The specimen gun is arranged so that either the flat spring or the spiral spring extractor may be used for the purpose of testing the merits of both. This gun has been

fired about 5,000 times—3,700 times with the spiral spring extractor. Both the extractors work well throughout, and either would, in my opinion, be suitable for the service. The spiral spring extractor has the advantage of being cheaper to make and to be better protected from dirt and moisture. The other one is more accessible in case of accident. Not having any authority to make any change, the models are being made for the flat spring."

These opinions seem to justify the conclusion reached by the Court of Claims—that, as mechanical devices, there is no difference between the flat spring extractor ejector and the spiral spring extractor ejector.

The point is also made by the Assistant Attorney-General that the evidence does not justify the conclusion of the court, that a contract existed between the Berdan Firearms Manufacturing Company on the one hand and the Government, through its duly constituted officers, on the other. The facts set forth in the record are relied upon by the claimant as justifying very conclusively the finding of the Court of Claims. The two parties were brought together by the proposal issued by the Hancock board and the offer of the Berdan Firearms Co., through its president, to grant to the Government the right to manufacture breech-loading arms containing the Berdan inventions described and claimed in patent No. 52,925. The Government, then, had knowledge of the inventions, of the inventor, and of the claimant as owner of the inventions. At the same time, by Perkins, president of the Arms Co., and by Berdan, as vice-president of the same company, three guns, which are spoken of as Nos. 1, 2, and 4, were submitted to the Hancock board, each of which contained the inventions described in the aforesaid patent, viz., the swinging, hinged breech block by which the recoil of the gun was resolved upon the shoulder or the

breech pin of the gun, on a line with the axis of the bore of the barrel, and the third notch or safety notch. With that knowledge of the parties and with knowledge of the inventions and of their adaptability to the service, and especially to the transformation of muzzle-loading guns into breech-loaders, the board recommended the "plan of alteration" submitted by Hiram Berdan.

The recommendation of the board was endorsed by the Lieutenant General, and, following that endorsement, the Secretary of War ordered the "conversion of 25,000 Springfield muskets into breech-loaders of *the best pattern*." That "best pattern" was to contain the inventions of Berdan, which had received the recommendation of the Hancock board and the endorsement of the Lieutenant General of the army (pp. 30–31–33). The Springfield gun of 1868 contains the Berdan invention as to the breech block.

In July, 1868, General Berdan filed two applications in the Patent Office for improvements in breech-loading guns. One of these, which, when the patent was issued, was numbered 88,436, contained specifications of and a claim for the spring extractor ejector which is now the subject of controversy. In consequence of delays at the Patent Office, General Berdan wrote a letter to General Dyer, Chief of Ordnance, dated the 3d day of August 1868, asking for the intervention of the War Department in his behalf and for speedy attention to the applications then pending in the Patent Office. On the 12th day of August of the same year General Schofield, then Secretary of War, addressed a letter to the Secretary of the Interior, asking attention to the Berdan applications, and saying: "That, so far as this Department is concerned, the early consideration of the aforesaid claims is regarded as being desirable" (pp. 42–43).

In 1873 "the Berdan extractor-ejector device (patent No. 88,436) was exhibited, in competition with other guns, to a board of officers detailed to test guns, and called the Terry board." * * * "In the report of that board the device was fully described."

The court said: "Berdan, as an officer of plaintiffs herein, assignees of his inventions, during the period covered by this action, was in constant communication with the ordnance officers, requesting the use of his devices by the Government; they knew him as an inventor and knew his inventions as soon as they were patented" (p. 39).

The acts referred to seem to justify the conclusion reached by the court, that an implied contract existed between the Berdan Firearms Co. and the Government, through its duly constituted officers.

A summary of the claimant's position may be thus stated:

(1) The Court of Claims found as a fact that the Goverment had used the Berdan spring, as the same is described and claimed in patent No. 88,436, and also that a contract existed between the authorized agents and officers of the Government and the representatives of the Berdan Firearms Manufacturing Co., by which the officers of the Government were to use the said devices, and for which use compensation was to be made to the plaintiff (Finding XXIII, p. 46).

(2) The claimant maintains that the rule established by the Court of Claims and by which the finding was made in favor of the claimant and a judgment for the sum of $95,004.36 was rendered, was an erroneous rule, by the operation of which proper compensation was not awarded to the claimant.

If the contract matured in 1866, when the Hancock

board called for proposals, and when proposals were tendered by the Berdan Firearms Co., and when the gun submitted by the company, known as the Berdan gun, was approved and recommended by the board,—and when the report containing that recommendation was endorsed by the Lieutenant General, and his endorsement was approved by the Secretary of War, who thereupon ordered "the conversion of 25,000 Springfield muskets into breech-loaders of the best pattern," which muskets, as appears from the exhibit and the record, contained the Berdan breech-block invention described and claimed in patent No. 52,925, being the same invention that was approved by the Hancock board, it follows that the compensation should be determined by reference to the proposal of the Berdan Firearms Co. submitted to the Hancock board March 27, 1866 (Finding IX, p. 30).

If this view should be accepted, compensation would be allowed at the prescribed rate for each musket, and all investigation as to the use of the breech-block arrangement as described in patent No. 52,925 would become unnecessary. The same result would seem to follow as to the obligation of the contracting parties, if the contract was not consummated until 1868, when the Secretary of War interposed to secure the early consideration of the Berdan applications then pending in the Patent Office; or if not consummated until the meeting of the Terry board in the year 1873; or if not until the recognition by Congress in 1872 and 1876 of the existence of patented inventions that had been incorporated in the Springfield musket.

(3) If, however, the court should be of opinion that the contract did not so take effect as that the Government was under obligation to pay the rate specified in the proposal of March, 1866, then it would follow that the claimant is entitled to receive compensation under the rule

which has been recognized by the Supreme Court, viz: That the party using a patented machine is to pay for such use a sum equal to the benefit derived from the use, over and above the benefit which might have been obtained by the use of any other device that was at the time of use within reach of the party.

In 1866, and from thence onward, the Allin gun, as it is known, was the best device within the reach of the Government. In cost of manufacture, the Berdan spring had the advantage over the Allin spring in the sum of $1.25 for each gun. In addition to that advantage, the officers of the Army testified that the superior quality of the Berdan extractor ejector over the Allin extractor was $1.41⅔ per musket, showing a gross benefit of $2.66⅔ per musket.

(4) The claimant maintains that the Berdan breech-block arrangement and the safety notch have been used in all the Springfield guns manufactured since 1874, and in the combinations described and claimed in the Berdan patent No. 52,925. The claimant also maintains that if the court should find that the breech-block arrangement and the safety notch are not found in the Springfield musket in the combination claimed in said patent, the Government is liable, nevertheless, for the use of either or of both of the features, whether used individually, or in combination with each other, or in a combination other than that specified and claimed in the patent.

THE COURT OF CLAIMS ERRED IN HOLDING THAT FOR ALL USE MADE OF THE CLAIMANT'S PATENT No. 88,436, MORE THAN SIX YEARS PRIOR TO THE FILING OF THE PETITION, HIS RIGHTS WERE BARRED BY THE STATUTE OF LIMITATIONS.

THE CLAIMANT'S CAUSE OF ACTION DID NOT ACCRUE IN THE SENSE OF THE STATUTE (ACT OF MARCH 3, 1887, CHAP. 359), UNTIL HIS PATENT EXPIRED, VIZ., MARCH 10, 1886.

THE JUDGMENT WAS FOR 159,940 MUSKETS MANUFACTURED

OR ALTERED BETWEEN JULY 26, 1881 (SIX YEARS BEFORE THE FILING OF THE PETITION), AND THE EXPIRATION OF THE PATENT. IT SHOULD HAVE BEEN ALSO IN HIS FAVOR FOR THE 224,952 ADDITIONAL MUSKETS MANUFACTURED OR ALTERED BETWEEN JANUARY 1, 1869, AND JULY 26, 1881—IN ALL, 384,892 MUSKETS. (RECORD, P. 46, FINDING XXIV.)

A.

The claimant's case stands upon an implied contract, to be implied from all the facts and circumstances of the case.

From these facts and circumstances, no other contract can be fairly and reasonably implied than an *entire* contract, *viz.*, that the Government should have the *continuous* use of the patent as long as it lasted, and as much as it should see fit to use it, and that he should be paid a fair compensation, which should be *larger or smaller according to the total number of muskets on which it should be used*, and which could only be determined when the continuous use ceased. This compensation was necessarily to be at a less rate per gun, if it should turn out to have been used on four hundred thousand muskets, than if only upon forty thousand or four thousand. This was so not merely from the nature of the case, but also from the special circumstances appearing in the findings. All the elements of the contract must be found by implication, and these elements of continuous use, of entirety, and that the rate of compensation per gun should be graded inversely to the number used during the life of the patent are essential features of the contract.

The court below proceeded, properly, on this ground so far as it went, but it did not go far enough. The logic of its own opinion required it to go further, and to find that the contract implied was *not a separate contract for each*

gun, but one entire contract for the whole continuous use, and that the compensation should be ascertained fairly at the end, when only it could be known on how many it had been used.

"LASTLY," the court says (Record, p. 58), "the quality of the license *and the quantity of the arms* are to be considered."

How can they be considered by the court in implying the contract, unless they are also deemed to have been considered by the parties in making it? The court below further declared that—

"The adoption of it" (the invention) "by their own government has a certain value in itself. *Of more importance is the large number of arms to be manufactured*, for he who deals by *wholesale charges a less percentage* of profit than he who deals by *retail*, especially when he is put to no cost of manufacture.

"From *all this* we deduce *these elements of importance to a contract made in* 1869, value in the invention, uncertainty in the art, danger of litigation, *a valuable customer*, *a large contract*, &c."

Surely, a separate contract for each gun (a dealing by "retail") could not be so described. The "*large* contract" was the *entire* contract for whatever use the Government should determine to make of the invention, as the art developed and the matter proceeded, which could not be and was not determined till the patent expired and the liability to pay at all terminated.

B.

The court below says, very properly, "We must first place ourselves in the position occupied by the contract-

ing parties in 1869, when the patent was issued," and when it finds the contract was made (Record, p. 58). Now, in 1869, everything in relation to the claimant's device was in a state of utter uncertainty, its validity, its utility to the Government, the practicability of its application to muzzle-loading, and especially its value, and how much it would be used, were absolutely unknown, and incapable of immediate ascertainment. As the court says:

"In 1869 the defendants had open to their choice very many devices, and there remained the probability of still further improvements, for the art was in a feverish state and invention was rapidly succeeding invention. *There was then no element of certainty;* now, after twenty years, we may conclude that the device adopted was the best possible, but then no one could know what the next day would bring forth; nor was it then possible to foresee the great success which has since been achieved.

"We know now that the Springfield extractor-ejector device is valuable; that it is durable and useful; that it is believed to be the best known in art for use in a single-fire musket of the Springfield type, *but none of this was known in* 1869. *Then all was in doubt;* neither side knew that with the Berdan-Adams device final success in extractor-ejector devices had been attained; nor did either side know what was the extent of danger from attack by other patentees whose devices very closely resembled that adopted."

Besides its constant need of arms to be newly manufactured, the Government had on hand in its arsenals several hundred thousand old muzzle-loading Springfield muskets, to which this device might or might not be applied, and might be more or less applied, as it should happen.

How unreasonable and impossible, then, to imply and impute to parties dealing for the use of such a device at

such a time, and under such circumstances, an *other contract as to rate of compensation* than one dependent upon the *final* result, upon *how much* it was used, and so of what value it proved to the Government.

C.

It appears, too, that the parties here actually proceeded upon this theory, of necessity postponing to the end, and to the ascertained result, the fixing of any rate of compensation. It was agreed that it should be used by the Government at the request of the claimant, but the rate was left to be determined at the end and by the result.

The Government began in January, 1866, by creating the Hancock board—

"To examine thoroughly and recommend what form of breech-loader should be *adopted* for *future* construction, and what form *for changes of muskets already constructed* to breech-loaders.

"Each person who submits an arm to the board to be required to state in writing the lowest price at which it will be furnished in the event of its being adopted by the Government." (Record, p. 29, Finding I.)

This board issued a blank form of proposal for proprietors of patent rights only, *in which the one cardinal feature was that the price should be fixed on a sliding scale —the more used the less rate.* (Record, p. 30, Finding II.)

The claimants made an actual proposal on such a blank. (Record, p. 30–31, Findings III, IV.)

That proposal was not, however, accepted, and no written contract was made, but it was obviously understood by both parties that the more muskets it was used upon in all, the less rate should be paid.

The board recommended the plan of alteration submit-

ted by H. Berdan. The Chief of Ordnance recommended that fifty new arms on Berdan's model be made and tested in the field, but the Lieut. General disapproved this, *because there was a large number of muzzle-loading arms on hand capable of economical alteration.*" (Record, p. 33, Finding IX.)

The 19th finding shows that while the War Department did not deny the claims of inventors for compensation for their devices used by the Government, its constant policy and practice was never to determine them, "but that the claim should be presented without prejudice before some other tribunal than an executive department," and that, notwithstanding this, Berdan, representing the plaintiffs, was from the beginning to the end in constant communication with the ordnance officers, *requesting the use of his device by the* Government. They knew him as an inventor, and knew his inventions as soon as they were patented.

The 21st finding shows that all patentees offered their devices on *the sliding scale of compensation.* No other plan affixing the rate was or could have been thought of by anybody.

The 22d finding shows that there was no practicable mode of determining the *quantum meruit* but from a review of *all the facts from the beginning to the end of the Government's continuous use*, and it is evident from the facts there stated that the parties, in the absence of any express agreement as to price, could have contemplated and did contemplate no other possible way.

The 23d finding shows that the Government officers from the outset declared themselves powerless to settle the rate of compensation; all they could say was that, if any of Berdan's features should be used by the Government in the Springfield guns, the ordnance officers ex-

pected to pay for them when the claimant had gone through the proper channels and settled the claim. "It was always in doubt" whether the ordnance officers should decide *finally* what they believed to be true, that plaintiffs were entitled to compensation, or whether they should leave that matter to the courts or to some other competent authority. (Opinion, p. 56.)

It is not enough to gather, from the facts and circumstances of the particular case, merely an implied contract to pay for the plaintiff's device, but the court must go on and imply and impute to the parties an agreement as to the rate to be paid, "being such a royalty as it may reasonably be presumed the defendants would have been willing to pay and the claimant to accept, *if the matter at the outset had gone* to an express agreement."

McKeen *v.* U. S., 14 Ct. Rep., p. 425.

And we submit, with all confidence, that, from the particular facts and circumstances of this case, no agreement as to price can reasonably be implied, other than that when it should be ascertained upon how many guns the defendant has used the device, and what it was worth, *upon the whole*, to the defendant, it should then, and not before, pay *according to the use made.*

Such being the nature of the contract implied, a suit commenced prior to this ascertainment would have been premature, and would properly have been dismissed. Had the plaintiffs sued when it had been used upon forty or four hundred or four thousand guns, the Government's answer would have been complete, *viz:* By the terms of our contract it cannot yet be determined what it is worth—how much you ought or are entitled to be paid. You must wait until we have worked out our right. And so, if the plaintiffs had sued upon any smaller number, less than the whole as finally ascertained.

It is thus manifest that the only contract that can be implied is an *entire* contract, for the whole use during the life of the patent, and that only from the date when the patent expired or the use terminated before that could the statute of limitations begin to run.

D.

Again, under the act of March 3, 1887, defining the jurisdiction of the Court of Claims and giving it jurisdiction in equity, the action may properly be regarded as an action for an accounting, and the same result is reached.

No account or statement showing the number of muskets on which Berdan's invention (No. 88,436) had been used had ever been rendered or made up. Berdan did not know, and it was impossible for him to know, the number. It was only by such suit as this that he could compel an accounting, and it is only by the actual accounting had in this suit that the aggregate number has been ascertained, which can be made the basis of determining the fair rate of compensation. To this accounting the plaintiffs had a clear right. It could by no possibility have been had or properly demanded until the patent and the use under it expired, and so that was necessarily the date at which the statute of limitations began to run against it as a suit for an accounting.

E.

The authorities relied on by the Court of Claims for its decision on the question of the statute of limitations do not sustain that decision, and the weight of authority requires directly the opposite conclusion.

The *Butler Case*, relied upon by the Court of Claims, is, upon its special facts, utterly inapplicable. There was nothing in that case from which a contract for a *continuous* user could be deduced, and, of course, it is of the very essence of the present case, especially so far as concerns the application of the statute of limitations, that upon the facts the contract must here be deemed to be an entire and continuous contract for the whole use of the patent by the Government during the life of the patent. If the contract was *entire*, and the user by the Government intended to be *continuous*, as, under the facts of this case, we contend that it must necessarily have been, then it is well settled that the statute of limitations is inapplicable.

Hall v. *Wood*, 9 Gray, 60.

Unless we are to make the impossible assumption that the parties intended that Berdan should be compensated for each gun upon which his patent was used, and intended that a separate contract should exist in respect to each gun, then the contract must be entire for the whole use of the patent during its life, and the statute of limitations cannot apply. As the supreme judicial court of Massachusetts has said, speaking of a contract for the services of an attorney in an action:

"If treated as a distinct contract for each item of service and expenditure as they occurred, nearly the whole of the plaintiff's claim is barred by the statute. If, on the other hand, it is held to be a contract for *continuous labor and services*, and is considered as *one entire demand*, the period of six years had not elapsed, and the plaintiff may recover the whole of his claim. The principle as applied to contracts that are entire is clear."

Eliot *v.* Lawton, 7 Allen, 274, at p. 275.

THE CONTRACT WAS HELD TO BE ENTIRE.

It is important to bear in mind the nature of an implied contract.

"Implied contracts," says Blackstone, "are *such as reason and justice dictate, and which, therefore, the law presumes* that every man undertakes to perform."
2 Blackstone's Comm. 443.

As Chief Justice Marshall has declared —

"A great mass of human transactions depends upon implied contracts, upon contracts which are not written, but which grow out of the *acts* of the parties. In such cases, *the parties are supposed to have made those stipulations which, as honest, fair, and just men, they ought to have made.* When the law assumes that they have made these stipulations, it does not vary their contract or introduce new terms into it, but declares that *certain acts, unexplained by compact, impose certain duties*, and that the parties had stipulated for their performance."
Ogden v. *Saunders*, 12 Wheat., at p. 341, bottom.

Mr. Parsons forciby says that—

"The question whether a contract is entire or separable is often of great importance. Any contract may consist of many parts; and these may be considered as parts of one whole or as so many distinct contracts entered into at one time and expressed in the same instrument, but not thereby made one contract. No precise rule can be given by which this question in a given case may be settled. Like most other questions of construction, it depends upon the *intention of the parties*, and this must be considered in each case by considering the language employed and the subject-matter of the contract. * * * And *if the consideration to be paid is single and entire, the contract must be held to be entire*, although the subject of the con-

tract may consist of several distinct and wholly independent items."

2 Parsons on Contracts, 7th ed., 648.

Upon this subject of the entirety of the contract, there is in this court a very instructive and quite conclusive case.

In *Steam Packet Company* v. *Sickles* (10 How. 419, at p. 440 to 441) the plaintiff had entered into a contract with the defendants for the use by the defendants of a certain patented machine of the plaintiff's upon the steamboat of the defendants, the purpose of the machine being to save fuel in the operation of the boats. By the terms of the contract the defendants were to continue the use on their boat "*during the continuance of the patent.*" The plaintiffs having sued without regard to the stipulations of the contract, and having threatened to bring an action *every week* to recover the amount due under the terms of the contract, and the court below having substantially instructed the jury that such an action *ad interim* would lie, this court, in holding such instruction to be error, said:

"If the plaintiffs had complied with the request of the president of the company, in a letter addressed to them on the 14th of April, 1841, after the dispute about the nature of the contract had arisen, and taken their cut-off from the boat, and thus put an end to the contract, the instructions given by the court would have been undoubtedly correct. But as the record shows that the plaintiffs have refused to annul the contract, a very important question arises—whether this action and five hundred others, which the plaintiffs have expressed their determination to continue to institute, can be supported on this one contract. By the contract as proved and declared on, the defendants, after the machine has been erected on their boat, are to continue to use it 'during the continuance of the patent,' if the boat should last so long. The compensation to be paid by the defendants is to be

measured by the amount of saving of fuel which the machine shall effect. The mode of ascertaining this saving is pointed out, and the ratio in which it is to be divided. The first $250 saved are all to go to the plaintiffs, and three-fourths of all the balance. *But the contract is wholly silent as to the time when any account shall be rendered or payments made. The defendants have not agreed to pay by the trip, or settle their account every day, or week, or year; or at the end of 27½ weeks, the time for which this suit is instituted.* The agreement on the part of the plaintiffs is, that the defendants shall use their machine for a certain time, in consideration of which defendants are to pay a certain sum of money. *It is true the exact sum is not stated; but the mode of rendering it certain is fully set forth. It is one entire contract, which cannot be divided into a thousand, as the plaintiffs imagine.* If the defendants had agreed to pay by instalments at the end of every week, or twenty-seven weeks, doubtless the plaintiffs could have sustained an action for the breach of each promise as the breaches successively occurred. But it is a well-settled principle of law that '*unless there be some express stipulation to the contrary, whenever an entire sum is to be paid for the entire work, the performance or service is a condition precedent. Being one consideration and one debt it cannot be divided.*' It was error, therefore, to instruct the jury that the plaintiffs were entitled to recover on the first count, if their machine was used by the defendants and was beneficial to them, without regard to the fact of the rescission, or continuance, or fulfilment of the contract on the part of the plaintiffs."

In *Shinn* v. *Bodine* (60 Pa. St. 182), the contract in question was to deliver 800 tons of coal at $6 per ton, the coal to be delivered on vessels as sent for during August and September. This was held to be an entire contract, the court saying:

"The entirety of a contract depends upon the intention of the parties and not on the divisibility of the subject.

The severable nature of the latter may often assist in determining the intention, but will not overcome the intent to make an entire contract when that is shown."

In *Hole* v. *Brown* (59 N. H. 55), the plaintiff had agreed to cut and haul from a certain lot of land to the defendants sawmill all the spruce lumber he could during the sledding season, after he had completed certain other work. The defendant agreed to pay five dollars per thousand feet for all lumber hauled. This was held to be an entire contract, the court saying:

"The lumber to be cut and hauled was determined as to time, by the termination of the sledding season; as to quantity, by measurement; as to price, by arithmetical computation."

But after all, as we have said, the question of the nature and the entirety of the contract being purely one of intention, the circumstances of this case and the transactions of the parties, coupled with the nature of the subject-matter of the present contract and of the contemplated user, absolutely demonstrate that in this instance the contract is entire for a continuous user during the life of the patent and not a several and distinct contract in respect to each gun. The statute of limitations is therefore no bar to any part of the claim.

GEO. S. BOUTWELL,
JOSEPH H. CHOATE,
For Claimant.

Office Supreme Court, U. S.
FILED.
NOV 2 1894
JAMES H. McKENNEY,
Clerk.

In the Supreme Court of the United States.

OCTOBER TERM, 1894.

THE UNITED STATES, APPELLANT,
v.
THE BERDAN FIREARMS MANUFACTURING COMPANY. } No. 128.

THE BERDAN FIREARMS MANUFACTURING COMPANY
v.
THE UNITED STATES. } No. 135.

APPEALS FROM THE COURT OF CLAIMS.

BRIEF FOR THE UNITED STATES.

In the Supreme Court of the United States.

OCTOBER TERM, 1894.

THE UNITED STATES, APPELLANT, *v.* THE BERDAN FIREARMS MANUFACTURING Company.	No. 128.
THE BERDAN FIREARMS MANUFACTURING Company *v.* THE UNITED STATES.	No. 135.

APPEALS FROM THE COURT OF CLAIMS.

BRIEF FOR THE UNITED STATES.

This is an appeal from a judgment of the Court of Claims, entered on the 8th day of December, 1890, in favor of The Berdan Firearms Manufacturing Company and against the United States for $95,004.36.

THE CASE.

On July 26, 1887, The Berdan Firearms Manufacturing Company, of New York, filed its petition in the Court of Claims, in which it set forth, *inter alia*, the grant of letters patent on the 9th of January, 1866, to the said company for certain new and useful improvements in breech-loading guns, which had been theretofore invented by Hiram Berdan, a citizen of the United States, and by him assigned to said company. That subsequent thereto other letters patent were issued to said company for other like improvements.

That on the 30th day of March, 1869, certain other letters patent were issued to said company, at the request of said Berdan, and were numbered 88436. The ninth claim of patent No. 88436, for spring working above and below the center of the ejector, is:

> A spring so applied in combination with an ejector of a breech-loading firearm that by the act of opening the breech piece it is caused to act alternately above and below the center of motion of the ejector and thereby to restrain the action of the ejector during the first part of the motion of the breech piece and afterwards to produce its sudden action, substantially as described.

That said several inventions, after having been examined and inspected by a board of officers, duly appointed for that purpose by the Secretary of War, were by said board approved and recommended for adoption.

That petitioners, on or about the 27th of March, 1866, had submitted a proposition in writing to said board at

its request specifying the terms and considerations and conditions upon which it would agree to allow the United States to use the inventions and improvements covered by said letters patent:

> That the War Department, after the adjournment of said board, proceeded to make alterations of the Springfield arm, and made use of some, if not all, of the Berdan claims as above set out applicable to such alterations. The proposition of the Berdan Firearms Manufacturing Company embraced not only the right on the part of the United States to use the inventions *then* made, but all other inventions that *might be* made by the said Hiram Berdan.

The petitioner claimed that it was entitled to recover from the United States, *by virtue of said contract*, the prices named therein for the guns manufactured.

> That in any event the petitioner * * * having offered the said inventions to the Government, and the said Government, through its duly accredited and authorized officers, having accepted the same by its use thereof, the United States became liable to pay the petitioner a fair and reasonable compensation therefor, which in view of the subsequent ascertained value of the invention and the prices paid for those sold by the Government, much exceeds in amount the prices named in the aforementioned proposition.

On October 8, 1887, claimant amended his petition by adding thereto an additional invention, patent No. 101418.

On July 2, 1888, claimant filed a second amended petition, which appears to have been sworn to June 29, 1889, in which they exhibit a table of guns, which they allege were manufactured by the United States from the 27th of

March, 1866, to the 31st of March, 1886, and containing petitioner's patented invention.

The United States, by proper pleading, denied the allegations of the petition; evidence was taken to support the issue thus joined, and the Court of Claims, on December 8, 1890, filed their findings of fact, 26 in number (pp. 29–46).

Findings I to IX, inclusive, show the formation of the Hancock Board, January 30, 1866; the proposition submitted by the Berdan Firearms Company to grant to the U. S. Government the right to use its patent in breech-loading guns; the action of the Hancock Board and of the Secretary of War thereon, and the following conclusion reached by the Court of Claims from all the facts relating thereto:

> No gun has been bought by the Government from defendants, and no gun has been manufactured by the Government which is a copy of the gun recommended by the Hancock Board.

This finding of fact would seem to dispose of the whole case stated in the petition, because, as has been seen, the case as there stated rests upon the proposition submitted to the Hancock Board and the results thereon.

The petition does, however, aver that on the 30th of March, 1869, letters patent No. 88436 were issued for an extractor and ejector.

Two questions then arise from the case presented in the record and are submitted here for decision:

First. Has the United States used, in the guns manufactured by it, the patented ejector device invented by Hiram Berdan and owned by petitioners?

Second. Was it used under conditions from which an undertaking on the part of the Government will be implied to pay petitioners for such use?

The Court of Claims has not found as a fact that any contract, express or implied, has been established. It has, however, found as a fact—

> That *since* 1874 the Berdan extractor-ejector device, described in patent 88436, has been used by defendant's ordnance officers knowingly and without claim of adverse right, believing the device in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by said letters patent, and with the anticipation that should the understanding of said ordnance officers as to plaintiffs' rights be judicially decided to be correct, the defendant would compensate plaintiffs for such use.

In the opinion of the Court of Claims, delivered by Judge Davis, it is said, page 57 :

> We are of opinion that under the rulings of the Supreme Court and of this court, heretofore cited, the facts disclose a contract between the parties to this action for the use of the extractor-ejector device.

And in the previous opinion, it is said, page 28:

> We conclude that the Government is using in the Springfield gun the ejector device, covered by letters patent No. 88436, owned by plaintiffs.

The opinion of the court below can not be resorted to to help the findings out. (*Dickinson* v. *Planters' Bank*, 16 Wall., 250; *Saltonstall* v. *Bertwell*, 150 U. S., 419.)

Attention will hereafter be called to the facts essential

to a judgment in this case, which are not certified here among the findings of fact in the court below.

The Court of Claims is required to certify to this court, as part of the record, "a finding by the Court of Claims of the facts in the case, established by the evidence, in the nature of a special verdict," and such findings are accepted as conclusive on appeal, except so far as they may be contradicted by other facts so certified.

We do not understand, however, that when the Court of Claims undertakes to certify here as a fact that which is not a fact "established by the evidence," but which is merely an inference drawn by the Court of Claims from facts which are established by the evidence, or where it undertakes to certify as a fact that which is really a conclusion drawn by it from the laws of physical science, that these are such facts "established by the evidence" as are conclusive on an appeal.

The specific findings of fact by the Court of Claims are, however, manifestly inconsistent with, and repugnant to, the ultimate conclusions announced by it. They show that—

(*a*) The Government has never used Berdan's patented invention of an ejector.

(*b*) That upon a competitive trial of the two invented devices of Berdan and Adams, respectively, the Government formally and expressly rejected Berdan's and adopted Adams's.

(*c*) That the two devices are not identical, nor are they mechanical equivalents of each other.

(*d*) That Adams's, and not Berdan's, was the prior invention.

(*c*) That a promise or undertaking by the Government to pay claimants here can not be implied from all the transactions and communications had between Berdan and the Government.

I.

THE GOVERNMENT HAS NEVER USED BERDAN'S PATENTED INVENTION OF AN EJECTOR.

Whatever devices may have been embraced in the patents offered to the Government through the Hancock Board by petitioners, in 1866, it is enough to state that it is ascertained as a fact in Finding IX, page 33, that—

> No gun has been bought by the Government from defendants and no gun has been manufactured by the Government which is a copy of the gun recommended by the Hancock Board.

An "ultimate conclusion" reached by the Court of Claims from Gen. Benét's opinion, page 46, is that—

> Upon the foregoing facts the court find that *since* 1874 the Berdan extractor ejector device, described in patent 88436, has been used by defendant's ordnance officers *knowingly* and without claim of adverse right, believing the device in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by said letters patent.

And yet that court finds, as a specific fact (p. 39), that—

> It does not appear that prior to the issue of patent, the ordnance officers *knew* of the specific devices protected by letters patent No. 88436, issued March 10, 1869, upon application filed July 21, 1868, except as hereinafter appears.

All that appears in the record "hereinafter" is the opinion of Gen. Benét, founded on the report of the Terry Board (p. 45).

It appears from Findings XVI and XVII that the *spiral-spring ejector* was invented by Benjamin F. Adams, an employé in the Springfield Armory, and that the *flat-spring ejector* was invented by Hiram Berdan, patent No. 88436; that—

> The only difference between the Berdan and Adams devices is that Berdan used a flat spring, while the Government used a spiral spring, with a spindle or plunger.

That the Government has used the spiral ejector in all the Springfield guns since 1868.

In its opinion, on page 26, the Court of Claims, speaking of the Sansom or Ball ejector, say:

> As this device proved ineffective, several employés of the Springfield Armory set to work to invent a practical ejector for the Government gun, one which would work efficiently, notwithstanding grit, dirt, and weather. One of these employés, *Benjamin F. Adams, did invent the device soon after adopted, and since then and now in the Springfield gun.* But Adams did not make his invention until after August, 1868, and Berdan's application for a patent for his device had then been some weeks on file. Adams worked independently of Berdan, and the case presents a not unusual coincidence of independent invention.

So it appears that the device used by the Government is not Berdan's invention, but the invention of Adams. And the sole ground upon which Berdan bases his claim is that although Adams's device is the one used by the Gov-

ernment, yet that Berdan invented his device first and obtained a patent for it.

It is not pretended that Adams knew of Berdan's invention. Indeed, it is expressly declared that Adams "worked independently of Berdan." Nor is it pretended that Adams knew of Berdan's application for a patent therefor in July. It does, however, appear, and is found as a fact, that as early as the fall of 1868 the devices of both Adams and Berdan were examined and tested by the Government's officers; that Adams's device was adopted, and ever since been used by the Government, and that Berdan did not obtain a patent for his device until March 10, 1869. And the case, then, is this: Two inventors offer their devices to the Government for competitive examination and trial; they are both thoroughly tested, and one is found to be superior to the other, and for that reason is preferred and adopted. The rejected inventor subsequently obtains a patent for his invention, and then on the footing of that patent asserts a claim against the Government for the use of his patented invention on the ground that the invented device actually used by the Government, and with which he had entered into a fair and open competition before chosen arbiters, was but the mechanical equivalent of his own invention, and that the Government in using the adopted device was thereby infringing his patent.

Now it may be true that if the Government had invited an examination and trial of Berdan's invention before patent, but after application for patent, and having thus obtained knowledge and possession of the invented device

had appropriated it to its own use; that from that an undertaking or promise on the part of the Government would be implied to pay Berdan a reasonable compensation. But the Government has not appropriated Berdan's patented device. It has adopted the device invented by one of its own employés, who has used the time, material, and instruments of the Government in the application of his invention and has made no demand upon the Government for its use of his device. And, as said by the Court of Claims in its opinion on page 15, in speaking of the relative claims of Berdan and Allin:

> We must keep steadily in mind the one point under consideration. This point does not relate to the value of Berdan's invention, but to the problem made up of these two elements: What did he *patent*—not what did he *invent*; and, have the devices patented by him been incorporated into the Springfield gun?

Can it be possible that if an officer of the Government, whether the Secretary of War, the Chief of Ordnance, or an employé in the armory, invents a device, working independently of anyone else, without knowledge of any other invention, incipient or complete, and applies it to the use of the Government in its works, that another inventor of the identical device can, on the footing of a patent subsequently obtained, successfully assert a claim against the Government for the infringement of his patent on the ground that the two devices are mechanically equivalent?

And yet, it is conceded by the Court of Claims in its opinion, and ascertained as a fact in its findings, that the Government has never actually used the invention of

Berdan, and that the sole basis of the judgment of the Court of Claims is that while the Government has not actually used Berdan's device, it has used Adams's device, which is substantially the same as Berdan's.

II.

THAT UPON A COMPETITIVE TRIAL OF THE TWO INVENTED DEVICES OF BERDAN AND ADAMS, RESPECTIVELY, THE GOVERNMENT FORMALLY AND EXPRESSLY REJECTED BERDAN'S AND ADOPTED ADAMS'S.

In Finding XXIII, pages 43 and 44, it appears that on the 25th of September, 1868, Col. Benton, commanding the Springfield armory, wrote to Gen. A. B. Dyer, Chief of Ordnance, in Washington, D. C., as follows:

> I have this day sent to your address, by express, a box containing a rifle musket, altered to a breech-loader on the plan of 1868, and a wooden model of the same, with a spiral-spring extractor. The specimen gun is arranged so that either the flat-spring or the spiral-spring extractor may be used for the purpose of testing the merits of both. This gun has been fired about 5,000 times—3,700 with the spiral-spring extractor. Both the extractors worked well throughout, and either would, in my opinion, be suitable for the service. The spiral-spring extractor has the advantage of being cheaper to make and to be better protected from dirt and moisture; the other one is more accessible in case of accidents. Not having any authority to make any changes, the models are being made for the flat spring. Mr. Adams, one of our workmen, suggested the peculiar arrangement of the spiral spring.

To this letter Gen. Dyer replied September 28, 1868, saying:

> The addition of the plunger to work between the spiral spring and the cam is believed to be an improvement, and you are authorized to introduce it if you should become satisfied that it is a desirable change.

And on November 12, 1868, Col. Treadwell, of the Ordnance Office of the War Department, wrote to Col. Benton as follows:

> The Secretary of War has approved of the spiral-spring ejector which you have adapted to this gun, and the number of muskets you are authorized to alter will be altered to conform to this model.

So, here it appears that certainly in the autumn of 1868 the Berdan extractor and the Adams extractor were subjected to experimental tests at the Springfield armory. The results were officially reported to the War Department and attention called to the advantages and disadvantages of each, the result being that the Government, through the Secretary of War, selected the Adams spiral-spring ejector as the best and ordered that the guns thereafter made should be made upon that model. And Finding XVI, which describes the Adams spiral-spring device, is that—

> Extraction and ejection of cartridges was thus performed in all Springfield guns, beginning with the model of 1868, and continuing since.

III.

THAT THE TWO DEVICES ARE NOT IDENTICAL, NOR ARE THEY MECHANICAL EQUIVALENTS OF EACH OTHER.

In Finding XVII it is said that—

> The only difference between the Berdan and Adams devices is that Berdan used a flat spring, while the Government used a spiral spring with a spindle or plunger. Both performed the same office and attained the same result in the same way. The use of the flat spring or of the spiral spring is matter of choice, and is in no way material to the result.

It may be noticed here that this finding as it originally stood did not have the words "with a spindle or plunger" after the words "spiral spring," and the original finding was objected to for that reason (p. 48), and was corrected by the court by making that addition (p. 49); and Gen. Dyer, Chief of Ordnance, in his letter to Col. Benton, says:

> The addition of a *plunger* to work between th spiral spring and the cam is believed to be an *improvement*.

If the two devices are mechanical equivalents of each other, and Berdan's was the first invention, the employment by the Government of Adams's device would be an infringement of Berdan's patent.

In *Machine Company* v. *Murphy* (97 U. S., 120), Mr. Justice Clifford said:

> In determining the question of infringement, the court or jury, as the case may be, are not to judge

> about similarities or differences by the names of things, but are to look at the machines, or their several devices or elements, in the light of what they do, or what office or function they perform, and to find that one thing is substantially the same as another, if it performs substantially the same function in substantially the same way, to obtain the same result, always bearing in mind that devices in a patented machine are different in the sense of the patent law when they perform different functions, or in a different way, or produce a substantially different result.

A screw and a square nail are used to join together distinct solid bodies. One has a flat surface and the other a spiral surface. They join the two bodies together by passing through both of them, but no one will contend that they are identical, or are mechanical equivalents of each other.

The object of the two devices here was to eject automatically the cartridge shell from the breech piece of the gun. The object in each case was effected by a spring; the one a flat spring and the other a spiral spring. The element of the spring itself, as well as the combination in which it was used in each case, is described in Findings XVI and XVII.

It is manifest that while the object was the same in both it was not effected in the same way. Nor were the *results* the same, except in the general sense that they both ejected the cartridge. But the attendant results were essentially different, as was ascertained by the experimental tests made at the Springfield Armory to determine the relative merits of the two devices.

In his official letter of September 25, 1868, Col. Benton says:

> The spiral spring extractor has the advantage of being cheaper to make and to be better protected from the dirt and moisture; the other one is more accessible in case of accidents.

In firearms especially it is of the very essence of an efficient device that it should produce the desired result, not once or twice, but all the time, and that it can be relied on in time of danger to produce this result. If it is not "protected from dirt and moisture" these in a short time will prevent the desired result by obstructing the operation of the delicate mechanism, and by excessive friction wear away the parts. That this is not refined speculation, or hypercriticism, has been authoritatively determined by the findings of fact in this case. Finding XV refers to what is known as the Lamson extractor. This was operated by a spring which is described in the opinion of the court on page 26 as a flat straight spring; and it is said there—

> This device would accelerate the cartridge efficiently, but soon became unserviceable and was discarded.

Because, as is said in the finding—

> The point of the spring was liable to stick against the ejector; the surface of the ejector became covered by a hard deposit from the smoke; against this the spring would not work.

Here, then, was an extractor, operated by a spring, which discharged the cartridge "efficiently," and yet was

discarded as unserviceable because liable to "a hard deposit from the smoke."

So, again, Smoot's device for an ejector, referred to in Finding XV, and described on page 27. This also consisted of a U spring under the barrel in the stock.

Now, if the Adams device is merely the mechanical equivalent of Berdan's device, because the result in both cases was produced by a spring, it is difficult to perceive why Berdan's device was not also merely the mechanical equivalent of the prior inventions of Smoot and of Ball (who invented the Lamson extractor).

An even stronger case, perhaps, is presented in the Allin gun, which was also invented by an employé of the Springfield Armory, and patented in 1865. This, too, had a cartridge ejector, described in the opinion of the court, pages 16–19. This is the gun which the court decided anticipated Berdan's invention and his patent No. 52925, and as to which the court said, page 15:

> But that is not the question in issue. We must keep steadily in mind the one point under consideration. This point does not relate to the value of Berdan's inventions, but to the problem made up of these two elements. What did he patent—not what did he invent—and have the devices patented by him been incorporated into the Springfield gun.

These, to be sure, are controlling questions, and should be kept steadily in view in the whole course of this inquiry.

Here are five distinct inventions: Allin's, Bell's, Smoot's, Berdan's, and Adams's. In each case the ejector is operated by a spring. All of them appear to have been

patented except Adams's. Never before has it been suggested that these several devices were the mechanical equivalents of each other.

In the National Armory at Springfield, the United States Government has been making a gun for many years which has been known distinctly as the "Springfield" gun. Into this gun it has from time to time incorporated every improved device, which in the judgment of its officers would make this gun a more efficient weapon.

An employé in this armory invented, in 1868, a device for ejecting a cartridge. This device was subjected to a rigid competitive trial with other devices having a like object. It was ascertained to be superior to the others. The result was announced to the War Department in an official letter to the commandant at the armory, and the Secretary of War directed that this device should thereafter be used in all the Springfield guns.

Berdan sues the Government for the use, in the Springfield gun, of his ejector device, and the Court of Claims has held that, although in point of fact the Government has never actually used Berdan's device at all, but did indeed decline and refuse to use it, preferring Adams' device to it; yet, that in using Adams's device it has infringed Berdan's patent, because Adams's device is but the mechanical equivalent of Berdan's patented invention.

We might pause here to suggest that this view, on which petitioners rely, and on which the court below has given judgment in Berdan's favor, does of itself defeat the whole of the claim, because it can not be said that the claim of petitioner against the Government is founded upon any

contract, express or implied, when it appears, as it does here, that the Government has explicitly refused to make a contract with Berdan for the use of his device, and has refused to adopt or use his device, from which use an implied contract might arise, but has, after bringing the devices of Adams and Berdan into competition with each other, formally and unequivocally rejected Berdan's and chosen Adams'; and now the whole basis of this claim is that the Government is liable in using Adams's device to demand for the *infringement* of Berdan's patent, because Adams's device, forsooth, is the mechanical equivalent of Berdan's.

It is quite manifest, from an examination of this record, where and how this notion of these two devices being mechanically equivalent originated.

In 1873, a board of officers called the "Terry Board," was formed to test guns. They made their report in 1873 or 1874.

In June, 1874, Gen. A. B. Dyer had ceased to be chief of ordnance and Gen. Benét had succeeded him.

Now it nowhere appears in this record, directly or inferentially, that Gen. Benét had any personal knowledge of the contest that had occurred between the Berdan device and the Adams device. But Gen. Benét read the report of the "Terry Board." And in Finding XXIII, page 45, the Court of Claims have solemnly certified, as an element which entered into their judgment in this case, that Gen. Benét—

> understood the Springfield device for extracting and ejecting the shell as described in the Terry report as "seemingly identical, certainly the mechanical

equivalent," of Berdan's device for the same subject covered by patent 88436. After the decision of the case of *McKeever* v. *The United States* in this court (December term, 1878, 14 C. Cls. R., 396), Gen. Benét has been of this decided opinion. * * * Gen. Benét, with this understanding, continued to manufacture the Springfield gun containing the disputed ejector and extractor device, after adjournment of the Terry Board, with the expectation that if the court sustained the claim by Berdan against the Government upon his patent, No. 88436, then the Government must pay him for the use of his invention. Plaintiffs have desired that the Government should use their patented devices, and have also desired and requested compensation for such use.

Upon the foregoing facts the court find, that since 1874 the Berdan extractor ejector device described in patent No. 88436 has been used by defendant's ordnance officers knowingly and without claim of adverse right, believing the device in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by said letters patent, and with the anticipation that, should the understanding of the said ordnance officers be judicially decided to be correct, the defendant would compen-

the plaintiff for such use.

So the conclusion reached by the Court of Claims rests upon the opinion of Gen. Benét, who appears to have been informed and enlightened only by what was contained in the report of the Terry Board, and because since 1874 the ordnance officers have *knowingly* used the device in the Springfield gun, believing it to be the mechanical equivalent of Berdan's device, an undertaking on the part of the Government must be implied to pay Berdan for the use by the Government of Adams's device.

With great propriety, then, did the Court of Claims, in its opinion, on page 12, say:

> None of the inventions which we have examined in relation to this case involve a generic idea or principle. They all relate to details of construction and embody the combination in different forms of old and familiar elements. So in the plantiff's patents *it is apparent that the claims are narrow.* They cover no general principle; they involve no novel elements, but are only, and only pretend to be, new combinations of old elements destined to accomplish in a novel manner a desired and useful result. That is, *they are narrow claims, and are to be strictly construed.*

THAT ADAMS'S, AND NOT BERDAN'S, WAS THE PRIOR INVENTION.

In its opinion, on page 26, the court below said:

> The time was very close between the two independent inventions of substantially the same device, but the findings show that Berdan had priority. He made application to the Patent Office July 21, 1868, while the Springfield extractor was not invented before the following September.

Let us look at the findings and see what they do really show. Finding III shows (p. 30):

> The Berdan Firearms Manufacturing Company, of New York, was then the owner of a certain patent, granted by the United States for an improvement in firearms, made by Hiram Berdan, namely, a patent issued February 27, 1866, and numbered 52925.

"About March 27, 1866, the said company presented to the said board of officers (Hancock Board), for their examination, breech-loading guns, and *later* presented a gun,

called No. 4, which was similar to the one described in the specifications and drawings of said letters patent No. 52925, except" in the particulars pointed out on page 31.

In a letter from petitioners to the Hancock Board, dated May 21, 1866, page 32, gun No. 4 is referred to.

On July 21, 1868, Berdan filed two applications in the Patent Office for improvements in breech-loading arms, for which patents were issued, namely, patent dated March 30, 1869, No. 88436, and patent dated April 5, 1870, No. 101418.

Finding XIII, page 35, states:

> It appears that the ejector in patent 52925 would only operate when a rim-fire cartridge was used. The Government uses center-fire cartridges.

Findings V and XIV show that in gun No 4, a model of which was before the Hancock Board, the extractor device consisted of a U spring.

> A friction plunger was placed in the middle in the bottom of the receiver, held up against the cartridge head by a flat spring placed underneath the barrel. * * * The Springfield gun of 1866 has a U spring. The ejector device (with certain exceptions) is the device found in the gun submitted by Berdan to the Hancock Board.
>
> In the Springfield gun of 1868 appears for the first time the extracting device since in use, and the hook spur and the friction plunger ceased to be used from that time.

Finding XVI, page 36:

> Extraction and ejection of cartridges was thus performed in all Springfield guns, beginning with the model of 1868 and continuing since. * * * This

> specific device was perfected by Benjamin F. Adams, an employé in the Springfield Armory; he invented it in the *autumn* of 1868.

On September 25, 1868, Col. Benton, commanding Springfield armory, in the letter to Gen. Dyer, Chief of Ordnance, already referred to, made a report is of the trial by actual experiment of the flat-spring ejector of Berdan and the spiral-spring ejector of Adams. It does not appear on what day, or, indeed, in what month the experiments were made; but certain it is that some time prior to September 25, 1868, Adams had perfected his device, and it had been incorporated in a gun which had been fired 3,700 times.

It is to be regretted that the exact date of Adams's invention was not ascertained. But it surely is not just or accurate to decide that it was *invented* in "September, 1868," or "in the autumn of 1868," when it appears that before September 25, 1868, the invention had been expressed in a completed instrument.

In Finding XIX, page 39, it is said:

> In 1867 it was known that Berdan was at work upon an ejector, and in August, 1868, that he had applied for patents for improvements in firearms. But it does not appear that prior to the issue of patent the ordnance officers knew of the specific devices protected by letters patent No. 88436, issued March 10, 1869, upon application filed July 21, 1868, except as hereinafter appears. (As before stated, all that appeared hereinafter was Gen. Benét's opinion, formed from the Terry report.)

It certainly does not appear from this finding when the extractor device in patent No. 88436 was invented by

Berdan. His device, with that of Adams, was subjected to competitive trial prior to September 25. If it can be inferred from that fact that Adams's invention of his device was in the month of September or in the autum of 1868, the only thing that repels the same inference as to Berdan is the fact that on July 21, 1868, he had applied for a patent for his device and Allin had not applied.

But the court can take judicial notice of the fact that the invention of Adams, and the perfected application of it, could not both have occurred in the three first weeks of September. The court may take this notice as well from the common knowledge of such matters as from the fact which appears here, that Berdan had been agonizing over his device for several years before it reached the stage at which it appeared at the trial prior to September 25, 1868, and was there adjudged to be inferior to Adams's device. In point of fact, it does not appear when the invention of either was first made.

THAT A PROMISE OR UNDERTAKING BY THE GOVERNMENT TO PAY CLAIMANTS HERE CAN NOT BE IMPLIED FROM ALL THE TRANSACTIONS AND COMMUNICATIONS HAD BETWEEN BERDAN AND THE GOVERNMENT.

It has already been intimated in passing that the very theory of the claim here asserted repels the idea of any contract, express or implied, between Berdan and the Government. As already shown, the device invented by Berdan has never been used by the Government. His claim is that the Adams invention, which the Government has adopted, is substantially the same as, or the

mechanical equivalent of, his invented device, which was patented subsequent to the Government's adoption of Adams's, and that the Government's use of Adams's is an *infringement* of his patent rights.

Berdan submitted his device to the Government for examination and trial. The Government subjected it to trial in September, 1868, and at the same time tried Adams's device. It rejected Berdan's device and adopted Adams's. It rejected Berdan's device because it had no mind to take it. It considerately and intentionally rejected it. It is absurd, then, to say that having refused to contract for it a contract will be raised by implication.

Berdan had three patented inventions. One was No. 52925. The Court of Claims decided (p. 21):

> Whatever be the history of the evolution of the present army gun (Springfield gun) plaintiff's patent, No. 52925, does not cover it.

Another was No. 101418. As to this the court said (p. 22):

> What we have already said as to the second claim under patent No. 52925 leads us to the conclusion that plaintiffs have no rights against the Government under this claim or the later patent.

As to the extractor and ejector device in these two patents the court say on page 25:

> But no device at all like the one we have been considering appears in any Government gun made after 1868, nineteen years before this action began.

Berdan's first communication with the Government was through the Hancock Board in 1866, when he

offered his patented breechloader, No. 52925, and gun No. 4, as to which the court say on page 33:

> No gun has been bought by the Government from defendants and no gun has been manufactured by the Government which is a copy of the gun recommended by the Hancock Board.

Finding XXIII, page 42, shows that in 1867, during the autumn, Berdan showed to Col. Benton, commanding the Springfield armory, at the armory, a transformed musket, containing the extractor ejector subsequently described in patent No. 88436; that Col. Benton tested the device, but expressed no opinion about it; that August 3 or 4, 1868, Berdan had a conversation with Gen. Dyer, Chief of Ordnance, upon the subject of his devices. Berdan's patent, No. 88436, was then pending in the Patent Office. The Chief of Ordnance said, in substance, that if any *of the features should be used by defendants in the Springfield gun, the ordnance officers expected to pay for them when the claimant had gone through the proper channels and settled the claim.*

On September 25, 1868, Col. Benton wrote to Gen. Dyer (p. 43), stating that he had tested both the Berdan and the Adams devices; and in consequence of that report the Secretary of War, on November 12, 1868, directed the adoption and use by the Government of Adams's device. So it appears that the contingency stated by Gen. Dyer in his conversation with Berdan a month previous—August, 1868—"that if any of the features should be used by defendants in the Springfield gun the ordnance officers expected to pay for them," etc., never arose. The features

of Berdan's device were never used in the Springfield gun. It will be observed, too, that in this correspondence no reference is made to the conversations alleged to have been had with them in 1867 and 1868 by Berdan. The findings of fact show no other communications between Berdan and the Government, and certainly those which are stated, so far from sustaining, exclude the notion of any contract.

In the case of *Palmer* v. *United States* (128 U. S., 262), Palmer had exhibited his invention to a board of Army officers, which recommended its adoption, and the Secretary of War adopted the device as a part of the equipment of infantry. The Government thereupon manufactured and used the patented invention. Action being brought to recover royalty upon the theory of an implied contract, plaintiff was successful; and on appeal to the Supreme Court the judgment was affirmed. Mr. Justice Bradley, delivering the opinion of the court, said:

> The Government used the claimant's improvements with his consent, and certainly with the expectation on his part of receiving a reasonable compensation for the license. This is not a claim for an infringement, but a claim of compensation for an authorized use. The claimant in this case invited the Government to adopt his patented infantry equipments and the Government did so. It is conceded on both sides that there was no infringement of the claimant's patent, and that whatever the Government did was done with the consent of the patentee and under his implied license.

The Government is altogether willing that its liability to the demand made here shall be determined by the tests suggested in the foregoing opinion. It submits that from

the findings of fact in this case it is ascertained that it not only did not "use claimant's improvements with his consent," but did not use them at all, but expressly declined to use them. It submits that this is not a "claim of compensation for authorized use," but is clearly and distinctly a "claim for an infringement." The sole basis of this claim as appears as well from claimant's petition as from the opinion of the court, is that the Government is liable, not because it has used Berdan's device, but because in using Adams's device it has used a mechanical equivalent to Berdan's. This fact, considered in connection with the further fact that upon competitive trial it expressly rejected Berdan's and chose Adams's device, would seem to be conclusive of the character of its liability (if any) in this case; that is, that it is a liability for an infringement and not a liability upon a contract.

We do not mean to be understood as saying that the Government may not be held liable for its appropriation and use of the patented invention of another. What we do mean to say is, that such liability can only arise under conditions from which a contract, promise, or undertaking on the part of the Government can be reasonably implied; and we submit that, under the conditions which the findings of fact here disclose, no such promise or undertaking can be implied, because the Government has expressly refused to use the explicit device for which compensation is here claimed; and having thus refused to use it, the only ground upon which liability can be claimed is, that in using the device which it has intentionally employed it has thereby unwittingly infringed the patented rights of Berdan.

OMISSION OF FACTS NECESSARY TO A JUDGMENT.

We have stated heretofore that attention would be called to certain facts necessary to a valid judgment, which do not appear in the findings of fact, and for the discovery of which recourse must be had to the opinions of the court. Among these may be noted the following:

(1) It is not found as a fact that the Government has ever used Berdan's device for an extractor prior to 1874.

(2) It is not found as a fact that Berdan's device has been used by the Government since 1874, except upon the theory that in using Adams's device they were using something which was mechanically equivalent to Berdan.

(3) That Finding XXIII, page 46, is inconsistent with Finding XVI, page 36, which is that the specific device invented by Adams was used in all Springfield guns "beginning with the model of 1868 and continuing since."

(4) It is not found that there was any express contract between Berdan and the Government; nor is it found specifically that there was any implied contract between them; nor are there found facts from which an implied contract can be raised.

HOLMES CONRAD,
Assistant Attorney-General.



DEC 20 1894
JAMES H. MCKENNEY,

In the Supreme Court of the United States.

OCTOBER TERM, 1894.

THE UNITED STATES, APPELLANT,
v.
THE BERDAN FIREARMS MANUFACTURING COMPANY. } No. 128.

THE BERDAN FIREARMS MANUFACTURING COMPANY
v.
THE UNITED STATES. } No. 135.

APPEALS FROM THE COURT OF CLAIMS.

BRIEF FOR THE UNITED STATES IN REPLY.

In the Supreme Court of the United States.

OCTOBER TERM, 1894.

THE UNITED STATES, APPELLANT, v. THE BERDAN FIREARMS MANUFACTURING COMPANY.	No. 128.
THE BERDAN FIREARMS MANUFACTURING COMPANY v. THE UNITED STATES.	No. 135.

APPEALS FROM THE COURT OF CLAIMS.

BRIEF FOR THE UNITED STATES IN REPLY.

In the brief for claimant (who is also plaintiff in error here) it is insisted that the Court of Claims erred—

I. In finding that the Springfield musket did not contain the invention described and claimed in patent No. 52925, as the said invention is described and claimed in that patent.

The patents, with their specifications and claims, are all made part of Finding XVIII, but the great mass of other evidence which was before the Court of Claims, and

was considered by it, is not before this court and no means are afforded by which the conclusions drawn by the lower court from all that evidence can be tested here.

The judgment of the Court of Claims, as to the legal effect of the "ultimate circumstantial facts" found by it, may be reviewed here if the question is properly presented. (*United States* v. *Pugh*, 99 U. S., 270.)

When that court has presented as part of their findings what they show to be all the testimony on which they base one of their ultimate essential facts, which they have also found, and on which their judgment rests, we must, if that testimony is not competent evidence of that fact, reverse the judgment for that reason. (*United States* v. *Clark*, 96 U. S., 40.)

Here the Court of Claims has found as facts—

IV. That on March 27, 1866, the claimant made to the Hancock Board a written proposition "to grant to the United States the right to manufacture the aforesaid breech-loading arms" on certain conditions therein specified (p. 30).

V. That with said proposition was presented for examination by that board breech-loading guns; "and *later* presented a gun called No. 4, which was similar to the one described in the specifications and drawings of letters patent No. 52925, except" in certain particulars therein set out (p. 31).

VII. That on May 21, 1866, General Berdan, vice-president of the claimant company, wrote a letter, which accompanied gun No. 4, to the Hancock Board, in which he says: "This gun is substantially the same as guns Nos. 1 and 2, submitted by me some time since."

VIII. The Chief of Ordnance in his report to the Secretary of War (p. 33), "alluding to Berdan gun *and four others*," recommended that fifty of each be prepared to be tested by the troops in the field. He also recommended the purchase of new arms to compare with the devices named (Berdan's among them) for altering the Springfield gun. On June 26, 1866, the Lieutenant-General approved the recommendations, except the one to place new patent arms in the hands of troops. On the same day the Secretary of War directed "the conversion of 25,000 Springfield muskets into breech-loaders of the best pattern."

The Court of Claims has found as an ultimate fact that—

> *No gun has been bought by the Government from defendants and no gun has been manufactured by the Government which is a copy of the gun recommended by the Hancock Board* (p. 33).

This, it would seem, should finally dispose of so much of the claim asserted here by these claimants as rests upon the transactions had with, and the conclusions reached by, the Hancock Board.

It will be observed that all of the facts and circumstances relating to the Hancock Board and claimant's communications and transactions therewith, the action of said board and the proceedings had thereon by the officers of the Government, occurred prior to June 27, 1866.

Not only is the ultimate finding of the Court of Claims conclusive as to any claim founded upon the circumstantial and ultimate facts found, but it can not be seriously con-

tended that any contract, expressed or implied, can be gathered from such facts and circumstances.

II. That the court erred in finding that the defendant was not liable for the use of a jointed swinging-breech piece, when so arranged in a breech-loading musket as that the brace of such breech piece would have a bearing upon the shoulder at the rear end of the chamber, which receives the jointed swinging-breech piece in such manner as that the recoil, when the musket is discharged, shall be upon a point of the shoulder in the plane of the axis of the bore of the gun, as the same is described in patent No. 52925, *unless* its use by the defendant was in combination with the elements described in said patent, and in some one of the claims of said patent.

I am unable to discover any such finding of the Court of Claims among those which are certified in this record.

As explained in the brief of claimant, this assignment of error is made on the assumption that a contract has been found to exist between claimant and defendant, and that in Finding XIV it is said that—

> The War Department, without admitting or denying the legal rights of inventors, in its endeavor to perfect the Government arm, takes advantage of all knowledge within its reach, and of all inventions. It proceeds upon the policy that executive officers should not decide upon such claims against the Government, or upon conflicting claims, but that the claim should be presented without prejudice before some other tribunal than an Executive Department.

In his brief it is said:

> The sole object of the board was to select from Berdan's system whatever could be made useful in

the alteration of the breech-loading guns, to which the attention of the board was then exclusively directed.

Findings XI and XII set out fully in detail the distinguishing characteristic features of the various elements employed in the several guns, and indicate their points of difference.

They do ascertain and find as facts that the Springfield gun, like the Allin gun, "is so arranged that with the hammer in the third or lowest notch, the breechblock can not accidentally unlock and open." That "the Berdan gun (patent 52925) was not loose-jointed," etc.

All of these findings, and others beside, the claimant in his brief attacks and essays to impeach.

As findings of fact they can not be questioned in this court on appeal where they depend upon evidence not furnished in this record. How can their correctness be questioned here, where none of the expert testimony—covering, as it does, so many hundreds of printed pages of the record in the Court of Claims—is not before this court. Is it to be insisted that this court shall, by a personal inspection of the mechanical devices themselves as they appear in the several guns exhibited here, and in the absence of the expert and other evidence which was before the lower court and fully considered by it, pass upon these questions and to that extent review the judgment of the court below.

If by this assignment of error it is meant that claimant should be allowed for the use by the Government of such of the several devices or elements as enter into patent No. 52925, and appear in the Springfield gun, it should be

enough to call attention to the fact that by Finding XII, "it is admitted that no single element in patent 52925 is new."

It will be observed that all that has heretofore been said relates to patent No. 52925, which was issued 27th day of February, 1866 (p. 30).

Gun No. 4, which was submitted to the Hancock Board with Berdan's letter of May 21, 1866—two months after claimant's proposition to that Board with guns Nos. 1, 2, and 3—does not appear to have been covered by any patent.

All four guns appear to have been examined by the Hancock Board; but as appears in Finding IV, p. 33, the Government never manufactured or used any of them.

NO JUDGMENT WHATEVER SHOULD HAVE BEEN GIVEN FOR CLAIMANT.

The Court of Claims, while denying to claimant any part of his demand for the alleged use by the Government of anything covered by patent 52925, has allowed it judgment for $95,004.36 "as a fair and reasonable royalty for the right to manufacture and use the extractor-ejector device" (p. 59). And in this, we think, that court has committed grave error.

Two devices for the extraction and ejection of cartridge shells appear to have been invented by two different persons, each without the knowledge of the other, and about the same time. One was the invention of Hiram Berdan; the other was the invention of Benjamin F. Adams. These two devices are described with sufficient particu-

larity in Findings XVI and XVII, respectively. Many devices have been invented and proposed for the extraction and ejection of cartridge shells. They will be found described in the opinion of the court, pp. 22 to 29.

The lever and the spring have been the mechanical principles employed in the invention of these devices.

As to the lever, it was held by the Court of Claims in 1892, in *The Morse Arms Manufacturing Company* v. *The United States*, 27 Ct. Cls., 363:

> "The extraction of cartridge shells by leverage was not then (1858) new." Of springs, every form and variety appear to have been tried; flat springs, spiral springs, and U springs.

The Springfield gun of 1866 had an extractor device which, with slight exceptions, was the device found in the gun submitted by Berdan to the Hancock Board. (Finding XIV, p. 36). This was known as the Allin device, which extracted, but did not eject the cartridge. After abandoning the Allin device the Government took up Bali's device, known as the Lamson extractor; the objection to which was that "the point of the spring was liable to stick against the ejector; the surface of the ejector became covered by a hard deposit from the smoke; against this the spring would not work."

Smoot's patent of August, 1867, was by a U spring.

The ground upon which the Court of Claims gave judgment in favor of the claimant here was that the Government had appropriated and used the Berdan device under circumstances from which the law raised by implication a promise to pay for such use.

The questions as to whether the Government did ever use the Berdan device, and whether a contract, express or implied, has ever existed are discussed in my brief heretofore filed.

The Court of Claims has not anywhere, in any of its findings, found that the United States has adopted or used the Berdan device. It has not found as a fact that any contract, express or implied, has ever existed between the United States and the claimant.

In Finding XXIII (p. 46) it said:

> Upon the foregoing facts the court finds that *since* 1874 the Berdan extractor-ejector device (described in patent No. 88436) has been used by defendant's ordnance officers knowingly and without claim of adverse right. Believing the device in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by said letters patent, and with the anticipation that should the understanding of the said ordnance officers as to plaintiff's rights be judicially decided to be correct, the defendant would compensate plaintiff for such use.

Here it is found that defendant's ordnance officers have used Berdan's device, and that *they* believed the device used in the Springfield gun to be the device, or the mechanical equivalent of the device, covered by letters patent No. 88436.

The Berdan device, which it is claimed the defendant had used, is not the device contained in the guns shown to the Hancock Board; that was under patent No. 52925, which is fully disposed of in Finding XIII.

The device here claimed is under patent No. 88436, issued March 20, 1869, and is fully described in Finding XVII.

Finding XVI describes the other device, which "was perfected by Benjamin F. Adams, an employee in the Springfield Armory; he invented it in the autumn of 1868." In its opinion, on page 26, the Court of Claims expressly declares that—

> One of these employees, Benjamin F. Adams, did invent the device soon after *adopted and since then and now in the Springfield gun.*

It might be difficult to explain how, if the Government *adopted* and since 1868 has used in the Springfield gun the device invented by Adams, the court could render judgment in favor of Berdan for the use by the Government of his device, which they say the Government has never adopted and never used.

Of these two devices it is said in Finding XVII:

> The only difference between Berdan and Adams devices is that Berdan used a flat spring while the Government used a spiral spring with a spindle or plunger. Both performed the same office and attained the same result in the same way. The use of the flat spring or of the spiral spring is matter of choice and is in no way material to the result.

Observe "that *Berdan* used a flat spring, while the *Government* used a spiral spring."

From which it would seem that the Government and Berdan were using two different springs; that, therefore, the Government was certainly not using Berdan's device, with its flat spring, but was using Adams's device, with its spiral spring.

How then, it may well be asked, has the Government been held liable to Berdan?

While the Court of Claims has carefully avoided any specific findings of the ultimate facts of the use by the Government of Berdan's device, or of any contract between the Government and the claimant, it has indicated in its two opinions the line of its argument, which is this: That Berdan's device was invented a short time prior to Adams's invention; that while the Government did actually adopt Adams's device and not Berdan's, yet that Berdan, having subsequently protected his invention by a patent, and General Benét, the Chief of Ordnance, having expressed the opinion that the two devices were but mechanical equivalents of each other, while the Government was in fact using Adams's device, it was in law using Berdan's patented invention (pp. 45, 46).

It certainly is a fact that "in the Springfield gun of 1868 appears for the first time the extracting device since in use." (Finding XIV.) That in September, 1868, the Adams and Berdan devices were tested at the Springfield armory with the result ascertained, that "the spiral spring extractor has the advantage of being cheaper to make and to be better protected from dirt and moisture; the other one is more accessible in case of accidents (p. 43). That in consequence of this result, on November 12, 1868, the Secretary of War approved of the spiral spring ejector and the commandant of the Springfield armory was directed to alter the muskets thereafter in conformity to this model.

It does not appear, and is not found as a fact, exactly when either of these devices was invented. It does ap-

pear that Berdan's application for a patent was pending in August, 1868. The patent was not granted until March 30, 1869.

In the opinion of the Court of Claims (p. 15) it is said:

> We must keep steadily in mind the point under consideration. This point does not relate to the value of Berdan's inventions, but to the problem made up of these two elements: What did he *patent*—not what did he *invent*—and, have the devices *patented* by him been incorporated into the Springfield gun?

Does the mere fact that Berdan's device was invented first give him a prior, lawful claim against the Government for use by it of his device, when it appears—as it does appear—that the device used by the Government was an invention of one of its own employees, made and so used long before Berdan obtained a patent for his device?

The Court of Claims, in its several findings, refers to Berdan's communication with the officers of the Government, and in Finding XIX says:

> Berdan, as an officer of plaintiffs herein, assignees of his invention during the period covered by this action, was in constant communication with the ordnance officers, requesting the use of his devices by the Government. They knew him as an inventor and knew his inventions as soon as they were patented. In 1867 it was known that Berdan was at work upon an ejector, and in August, 1868, that he had applied for patents for improvements in firearms. But it does not appear that prior to issue of patent the ordnance officers knew of specific devices protected by letters patent No. 88436, issued March 10, 1869, upon application filed July 21, 1868, except as hereinafter appears.

Suppose the device used in the Springfield gun was the device or the mechanical equivalent of the device covered by the patent. Should that fact alone entitle the claimant to this recovery? Here lies the determining element in this case.

The Court of Claims appear to have considered that the fact that the ordnance officers knew that Berdan was working at an ejector, and that they kept themselves advised of his patented inventions, is entitled to legal weight in the determination of this case, and should enter as an element into the judgment of the court. That court formerly decided otherwise in a case presenting much stronger grounds for equitable consideration than the present.

In *Fletcher* v. *The United States*, 11 Ct. Cls., 749, the Treasury Department had advertised in December, 1867, for persons to furnish designs for internal-revenue stamps and plans for their cancellation, "with a view to their adoption if found to be satisfactory and effectual." Soon after this advertisement Fletcher submitted designs which had been invented by him about August, 1867.

In the winter and spring of 1868 a number of designs were submitted by other inventors.

In 1864–5, Clark, an employee in the Department, invented a revenue stamp, which was used by the Government from 1868 to 1871.

On August 10, 1868, Fletcher applied for a patent. It was considered at the Patent Office that the application of Fletcher and Clark and others interfered. The Commissioner decided in favor of Clark. On appeal to the

supreme court of the District of Columbia this decision was reversed; and letters patent were awarded to Fletcher and were granted to him April 5, 1870.

In the Court of Claims, it was insisted on behalf of Fletcher that—

> By the advertisement for designs, the submission by the plaintiff of the stamp and the adoption and use thereof by the Government, an implied contract was created and the defendant is bound to pay a reasonable compensation for the use of the invention.

But the court in denying the prayer of Fletcher's petition said:

> We think the answer to this is, that the Government did not use the petitioner's stamp, nor contract with him.
>
> The evidence shows that both the petitioner and Clark were the original inventors of the same mechanical contrivance in the form of a stamp. But their several inventions were distinct things, for they had different origins and grew to their completion under different experiments and circumstances, and had different ownerships, for each invention was the property in possession of its inventor * * * till a patent was issued vesting exclusive rights in the patentee. * * * But the petitioner had no exclusive rights in his invention till he had obtained his patent, and if any rights accruing to him by that have been infringed, the remedy is not in our jurisdiction.

Now, here, while it does not appear when either of these two devices were *invented*, it does appear that Berdan did not apply for a patent for his invention until July 21, 1868 (p. 39). That the two devices were tested at the

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Now, here, while it does not appear when either of these two devices were *invented*, it does appear that Berdan did not apply for a patent for his invention until July 21, 1868 (p. 39). That the two devices were tested at the

Springfield Armory prior to September 25, 1868 (p. 43). That the ordnance officers of the Army do not appear to have known of Berdan's invention until the issuance of the patent, March 10, 1869 (p. 39). It does not appear that these officers knew of the Berdan extractor-ejector device, or had used it, knowing whose invention it was, until 1874 (p. 46). But it does appear that since sometime in 1868, the extractor-ejector device, which is now used by the Government in the Springfield guns, has been continuously used (p. 36). So that it does appear that certainly for more than a year before the date of Berdan's patent, the Government was using the device which it is claimed is now covered by Berdan's patent. If it be true that Berdan and Adams each invented the identical device, and allowed it to become known to the public, and the same was appropriated and used by the Government, as it might have been used by the public at large without liability to either inventor, certainly the subsequent granting of a patent to Berdan could not create a liability to him against the Government.

III. That the court erred in the formulation of the rule by which compensation was allowed for the use of the ejector device described and claimed in patent No. 88436.

The amount of the plaintiff's recovery against the defendant is stated for the first time in the "conclusion of law" found by the court, on page 47. The basis of the estimate is found in Findings XXII, in which the court says, on page 42, that:

> Upon the foregoing facts and circumstances (including said Findings IV and XXII), but without there being other evidence in the case, the court find

> the ultimate fact that 5 per cent upon the lowest cost of manufacturing the musket during the period covered by this action, as they construe the statute of limitations, was a fair and reasonable royalty for the right to manufacture and use the extractor-ejector device, covered by patent No. 88436.

So the court finds as an ultimate fact that 5 per cent upon the lowest cost of manufacturing the musket, etc., was a fair and reasonable royalty.

The lowest cost appears to have been $11.88, 5 per cent of which is .594. This applied to 159,940 muskets yields the amount of the judgment here of $95,004.36.

In *Suffolk Company* v. *Hayden*, 3 Wall., 319, the measure of damage was said to be "the utility and advantages, or value of the use of the improvement over the old mode, etc.," not the value of the patent itself. (*Dahlgren* v. *United States*, 16 C. Cls., 53.)

The reasoning of the court will be found on pp. 58, 59.

There is in this case no basis whatever for ascertaining, with any approximate degree of certainty, what the royalty should be on the manufacture and use of this extractor-ejector device. And it is, therefore, unprofitable to engage in any discussion as to whether the reasoning of the Court of Claims, by which this judgment was reached, was right or wrong, for the record here fails to disclose the elements which entered into that judgment.

In *Gill* v. *United States* (25 C. Cls., 427) the court said:

> The implication must be drawn from all the facts of the case and the contract implied must give effect as nearly as may be to the supposed intent of the parties. It is not the case of the owner of personal

> property who waives a tort and sues in contract; it is the case of an owner who offers his goods to a purchaser upon undefined terms and who consequently can not maintain an action of trover or replevin. The contract to be implied is one which ought to be inferred from all the facts of the case, recognizing a mutual intent in both parties and giving due regard to the rights of each.
>
> * * * * *
>
> The measure of damages in a case of implied contract is the market value of the thing at the time, not the value which subsequent transactions may attach or subsequent events disclose.

STATUTE OF LIMITATIONS.

This assignment of error makes apparent the fallacy which pervades the whole course of reasoning on which the judgment of the Court of Claims rests.

In order to this judgment it was necessary to find, or else to assume, that a contract existed between the United States and the claimant.

The same degree of uncertainty and doubt as to the existence of a contract, which appears in the original petition of the claimant on page 6, continues throughout the findings of the court, and is manifested there in the conspicuous failure to find that there was a contract, either express or implied, and it appears in the argument of counsel, who treat it as both an express and an implied contract.

It is well then to review the facts ascertained in this record, and ascertain from them, upon what grounds it

is insisted that there was an express contract and upon what grounds it is insisted that there was an implied contract between the parties.

As we have heretofore seen, the claimant here did submit a written proposition to the defendant's officers, for the grant to the United States of the right to manufacture "the aforesaid breech-loading arms" on the terms therein set out. This was on March 27, 1866. (Finding IV, p. 30.)

Again, on May 21, 1866, the claimant submitted a supplemental proposition as to gun No. 4. (Finding VII, p. 32.)

Now, both these propositions related to "breech-loading arms, and to gun No. 4," and did not relate to any separate element of those arms.

Neither of these propositions was accepted in terms by the United States, but the express finding of the Court of Claims is that—

> No gun has been bought by the Government from defendants and no gun has been manufactured by the Government which is a copy of the gun recommended by the Hancock Board. (Finding IX, p. 33.)

So, certainly, there could be no contract, express or implied, up to June, 1866, as to any gun, or part of gun, which was before the Hancock Board.

The only subject-matter left open between the parties is the extractor-ejector device, which first appears in the Springfield gun of 1868, as to which there could have been a contract, express or implied.

This device, it is found by the Court of Claims, was invented by General Berdan and also by Benjamin F. Adams.

Assuming, for the present, that these two devices were mechanical equivalents of each other, do the facts here show a contract between the Government and the claimants (who were the owners of Berdan's invention) by which the Government was bound to pay claimant for its use of such device?

When these devices were invented by the two persons respectively does not appear. It does appear, however, that Berdan applied for a patent for his invention on July 21, 1868, and the patent, No. 88436, was issued March 10, 1869. (Finding XIX, p. 39.)

It appears that in 1867, during the autumn, Berdan showed to Colonel Benton, commandant of the Springfield Armory, a transformed musket containing the extractor ejector, subsequently described in the specifications and claims of patent No. 88436. That on August 3 or 4, 1868 (misprinted 1889), Berdan had a conversation with General Dyer, then Chief of Ordnance, upon the subject of his *devices*. "During this conversation the Chief of Ordnance said, in substance, that he had—

> recommended that some steps should be taken or some court constituted for the purpose of determining the value of the various claims for devices used in the Springfield gun, the Army officers (in his opinion, he said) being powerless to settle the question. Berdan's application for patent, No. 88436, was then pending in the Patent Office, and Berdan explained, generally, its features. The Chief of Ordnance said, in substance, that if any of the features should be

> used by the defendants in the Springfield gun the ordnance officers expected to pay for them when the claimant had gone through the proper channels and settled the claim. (Finding XXIII, p. 42.)

On August 3, 1868, Berdan wrote to the Chief of Ordnance, asking that his applications for patents then pending should be disposed of "to enable me to present my claim to the Government for the use of said patent," and on August 12, 1868, this request of Berdan's was transmitted by the Secretary of War to the Secretary of the Interior.

At some time prior to September 25, 1868, the two devices of Berdan and Adams were subjected to trial tests at the Springfield Armory, and the result was reported to the Chief of Ordnance, and by him to the Secretary of War, and on August 12, 1868, the officer in charge of the ordnance office at the War Department wrote to the commandant of the Springfield Armory:

> The Secretary of War has approved of the *spiral-spring ejector* which you have adapted to this gun, and the number of muskets you are authorized to alter will be altered to conform to this model (pp. 43–44).

Now, the competitive trial had at the Springfield Armory was between the "spiral-spring ejector" which was the invention of Adams, and the "flat-spring ejector" which was the invention of Berdan.

And this trial resulted in the rejection of the Berdan invention and the adoption of the Adams invention.

So far were the officers of the Government from regarding these two devices as equivalents of each other that

not only were they brought into this sharp and rigorous competition but, as will be seen from the letter of Colonel Benton (p. 43), the arms which had up to that time been manufactured at the Springfield Armory embodied the *flat-spring* device, and Colonel Benton says in his letter;

> Not having any authority to make any changes the models are being made for the *flat spring*. Mr. Adams, one of our workmen, suggested the peculiar arrangement of the spiral spring.

And it required the express authority of the Secretary of War, conveyed in the letter of November 12, 1868, to enable the commandant of the armory to abandon the flat spring and adopt the spiral--spring ejector.

It further appears that the Berdan extractor-ejector device (patent 88436) was exhibited in competition with other guns to a board of officers detailed to test guns, and called the "Terry Board," in the year 1873. In the report of that Board the device was fully described (p. 45).

Now, if prior to 1873 the United States had adopted and was using Berdan's device, it is difficult to understand why the claimant should in that year exhibit this device, "in competition with other guns, to the 'Terry Board.'"

Some time after June, 1874, General Benét became Chief of Ordnance, and examined the "Terry Board" report, and he was of the "decided opinion" that "the Springfield device, for extracting and ejecting the shell, as described in the 'Terry' report, was 'seemingly identical, certainly the mechanical equivalent of Berdan's device for the same subject, covered by patent 88436.'"

General Benét, "with this understanding," continued the manufacture of the Springfield gun containing the dis-

puted ejector and extractor device, after adjournment of the Terry Board, with the expectation that *if the court sustained a claim by Berdan against the Government* upon his patent, No. 88436, then the Government must pay him for the use of his invention. Plaintiffs have desired that the Government should use their patented devices and have also desired and requested compensation for such use (pp. 45–46).

In June, 1876, Berdan wrote from Europe to Colonel Benton asking his assistance in Berdan's efforts, "to see if something can't be got from the Government for the use of my patent, on ejecting the shell by the power of a spring." To which Benton replied, declining any aid, "further than to inform you that it has been the practice of the War Department in similar cases, to refer them to the United States courts."

From all which it would seem to be very clear that neither General Benét nor Colonel Benton, nor any other officer of the Government, recognized that the Government was in fact using Berdan's device, or using it with his consent, or that in any way there was any liability upon the Government to Berdan or to the claimants here for its use of the device which it had adopted. They appear to have recognized throughout at every stage that there was a conflict of claims between the Government on the one hand, using the Adams device, and the claimants here on the other hand, owning the Berdan device. There does not appear in this case one single feature presented in the case of *Palmer* v. *United States*, 128 U. S., 262.

How can it be said that the Government, in its use of the device which it has adopted, has recognized the claimant's ownership thereof, when it put the claimant's device in direct competition with Adams's device, and as the result of such competition selected and adopted the Adams device, when uniformly and consistently, from 1868 down to the filing of the petition, it, as the owner of the Adams device, has through its ordnance officers expressly refused to recognize the validity of the claim here asserted; but has maintained throughout that in using the spiral-spring device it was using something wholly different from Berdan's invention.

The statute of limitations begins to run from the time the right of action accrues; and the obvious inquiry here would be, When did the right of action accrue to the claimants here? And to answer this we must know what the cause of action is upon which the right accrues.

It is insisted in the brief (p. 33) that from the facts and circumstances of the case "no other contract can be fairly or reasonably applied than an *entire* contract, viz: that the Government should have the continuous use of the patent as long as it lasted, and as much as it should see fit to use it, and that he should be paid a fair compensation which should be larger or smaller, according to the total number of muskets on which it should be used, and which could only be determined when the continuous use ceased.

We have seen that the only express terms of a contract which have ever been proposed were those submitted to the Hancock Board; and the Court of Claims has found as a fact that no guns of the kind submitted to that board have ever been made or used by the Government.

As to the extractor-ejector device, patented in 1869, we have seen exhibited here the same state of affairs which existed in the *Schillinger Case*, as to which this court said:

> The successive allegations place the parties in continued antagonism to each other, and there is no statement tending to show a coming together of minds in respect to anything.

There has been no recognition, in any form, by the Government of the right which the claimant asserts here. The most that can be said is, that the Government, while believing that it was using the device of Adams, and not intending to use the device of Berdan, has, by legal construction, used the latter, and has unwittingly placed itself in the attitude of an *infringer*. That being true, the right of action arose when the wrong was committed, and was barred long before the filing of this petition.

But, if it should be held that the Government is bound, as upon an implied contract, for the use of the extractor-ejector device, surely it can not be held that an implied contract for this device must be construed to be upon the terms of the written proposition submitted to the Hancock Board, long before this device was patented or invented, and which related in its terms to breech-loading arms.

If the Government has used the property of the claimant under circumstances from which a contract for such use will be implied, such implication can carry the promise no further than to pay the amount that such use was reasonably worth. It imposes no other terms upon the defendant than to pay the value of the use for the time and to the extent which he has enjoyed it. It does not

bind him to continue that use for any particular length of time, as the duration of a patent.

In determining the measure of damages there must be ascertained the extent to which the defendant has used the device, which in this case would be the number of guns in which it had been placed; and then the difference in value to the defendant of this device and the one it was using at the time of the adoption of this one.

WHAT WAS BERDAN'S DEVICE UNDER PATENT No. 88436?

It is remarkable that not only is this patent exhibited nowhere in this record, but, as will be found from examination, it was not in fact before the Court of Claims.

On page 4 it is thus described in the petition of claimant. The ninth claim of patent No. 88436 (March 30, 1869), for spring working above and below the center of the ejector, is:

> A spring so applied in combination with the ejector of a breech-loading firearm that, by the act of opening the breech piece it is caused to act alternately above and below the center of motion of the ejector, and thereby to restrain the action of the ejector during the first part of the motion of the breech piece, and afterwards to produce its sudden action substantially as described.

The mode of operation is described in Finding XVII.

The use of the spring in the devices for ejecting the shell was not new.

In the device which Berdan presented to the Hancock Board, under patent 52925, a U-spring was used; but, as appears in Finding XIII, this ejector would only operate

when a *rim-fire* cartridge was used. The Government uses only *center-fire* cartridges.

Ball's device used a flat spring, which answered the purpose very well, but was objected to because the surface of the ejector became covered by a hard deposit from the smoke.

So, it was not the feature of the *spring* which was claimed as the invention by Berdan, but a spring *so applied* as to produce the result claimed. The modes of operation of the two springs, respectively, are stated in Findings XVI and XVII, and will be considered by the court without further discussion here.

The question to which the mind of the court is directed here is this: The Court of Claims finds (Finding XVII) that—

> The only difference between the Berdan and Adams devices is that Berdan used a flat spring while the Government used a spiral spring, etc.

While the only claim asserted by the claimant in his petition at all is, that what he has invented and what the Government has used is "a spring *so applied* * * * that by the act of opening the breech piece it is caused to act alternately above and below the center of motion of the ejector," while in the Adams device the mode of operation, as appears in Finding XVI, is wholly different.

Berdan's invention, then, embraced no new elements, but only a combination of elements well known.

> A patent for a combination is not infringed by a combination which substantially differs from such patent in any of its parts. (*McMurray* v. *Mallory*, 111 U. S., 97.)

A combination is always an entirety. The patentee must stand by his claim as he has made it. (*Schumacher* v. *Cornell*, 96 U. S., 549.)

A combination of the material parts of an entire machine is not infringed except by the use of the entire combination. (*Brown* v. *Guild*, 23 Wall., 181; *Electric R. R. Signal Co.* v. *Hall R. Signal Co.*, 114 U. S., 87.)

It is not only necessary to an infringement that the infringing device should perform the same service, or produce the same effect, but it must do it in substantially the same way. (*Werner* v. *King*, 96 U. S., 218; *Goodyear Co.* v. *Davis*, 102 U. S., 222.)

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